TRINETICS™

Synchronous close capacitor bank switching made easy

SmartClose
Synchronous Close
Capacitor Switches

HUBBELL
POWER SYSTEMS, INC.

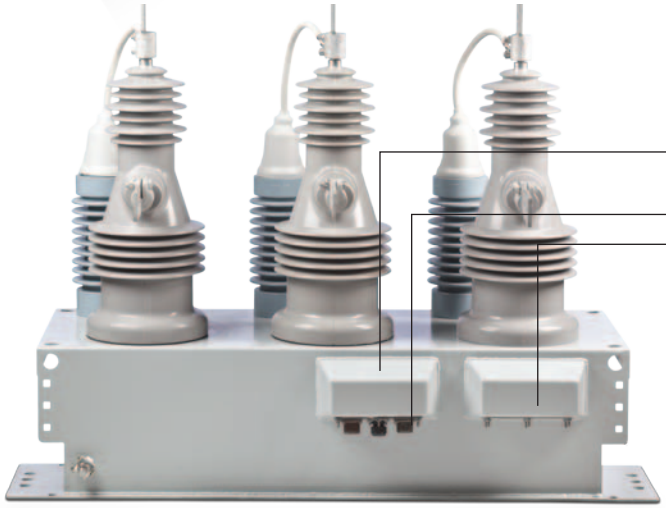
Streamline project commissioning, calibration, and setup time.

Trinetics® synchronous vacuum capacitor switches bring new focus to the synchronous close and zero voltage close capacitor bank-switching applications. Commissioning time, complexity and cost have been greatly reduced, while the precision and reliability of close on wave form switching has been substantially improved. Automatic self-calibration and durable, restrike-free, maintenance-free switching are just a few of the benefits gained by adding Trinetics® SmartClose synchronous vacuum switches to your capacitor bank applications. The UltraVac family of vacuum capacitor switches fully conforms to ANSI Standard C37.66-2005.

- Exceptional reliability and durability in synchronous close and zero voltage close applications
- 200A & 400A rating options
- 15kV & 25kV; 110kV & 125kV BIL
- Best in class C2 re-strike free
- Long life vacuum interrupter with solid-dielectric insulation for maintenance-free switching
- Eliminate the material cost and space required for inrush reactors
- Mitigate harmonics and switching disturbances that occur in back-to-back capacitor bank switching and large power capacitor bank switching
- One tank device configured for independent pole operation for three-phase applications

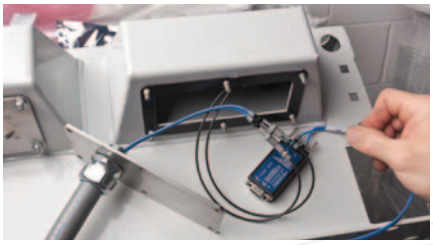
Features:

- Vacuum interrupters
- Integral voltage sensors
- Manual handles and position indicators



Features:

- Multi-pin connector for close/open command from cap control
- Multi-pin connector for aux supply
- Fiber optic port for waveform download



Convert any bank to synchronous close.

The unique design of the SmartClose capacitor switch includes six integral voltage sensors that detect the voltage waveform on both the capacitor side and the source side of each interrupter. A close command issued by a separate capacitor bank controller causes the SmartClose capacitor switch to close each interrupter independently when the voltage difference across each interrupter is zero. A simple close command to the SmartClose will initiate 3 phase zero voltage closing in all circuit configurations. Delta, Wye, Ungrounded Wye, and phase rotations are no longer a concern to the installer.

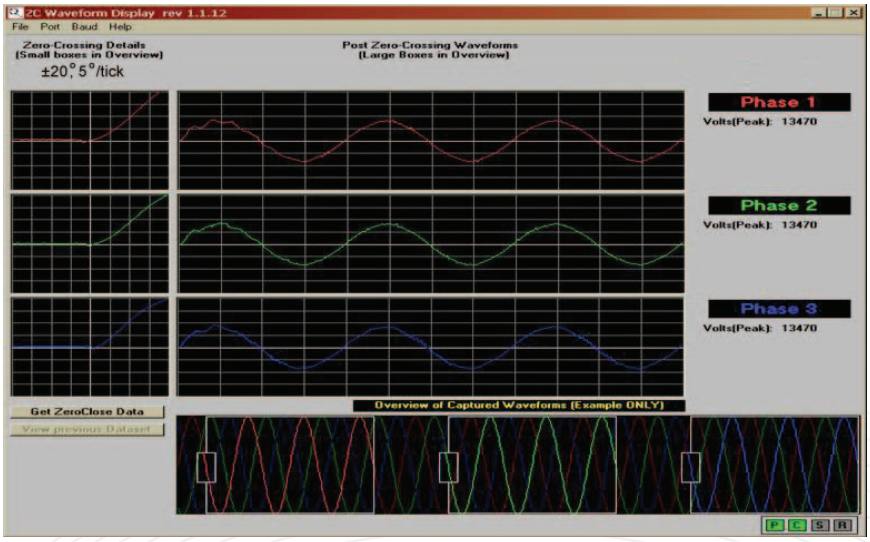
Zero close functionality is embedded in the SmartClose switch and is enabled and calibrated prior to shipment. This allows the user to separately select a preferred capacitor bank controller with a range of functionality ranging from lower cost Volt-Time controls such as Trinetics' ProCap C150T, to our ProCap C2000 VAR controls. Or alternatively, the switch can be remotely controlled through a separately supplied RTU/PLC controller.

The bottom line? The bank controller decides when the capacitor bank is needed; the SmartClose switch receives that command and performs the synchronous close automatically.

Key features of the SmartClose capacitor switch.

Feature	Function	Benefit
Internal CPU	Self-calibration and configuration	Plug and Play functionality reduces setting complexity and commissioning time.
Six embedded voltage sensors	Auto detects system parameters critical to proper waveform switching	Reduces site installation costs, set up time, and total commissioning time. Eliminates the need to input phase rotation or system configuration and grounding.
Loss of voltage trip	Removes cap banks from service during a reclosing protection sequence or during a sustained outage	Eliminates heavy inrush incurred when capacitor banks remain on line during a reclosing protection sequence or during service restoration.
Constant current supply	Compensates for internal temperature variations in key switch and drive system components	Eliminates "drift" and maintains best-in-class waveform close accuracy.
Switch fiber optic diagnostics port	Provides access to waveform capture files for downloading and analysis	Allows performance verification of waveform close accuracy without the need for expensive or bulky high speed recording equipment.
Easy interface for capacitor bank controls	Supports your chosen capacitor bank controller	Use familiar legacy capacitor bank controls. Eliminates retraining associated with new capacitor bank controls.

Performance	Accuracy
Successful close	within 21˚
SmartClose	2˚ to 5˚



GY circuit, 23.9kV phase-to-phase, 200kVAr capacitors/phase.

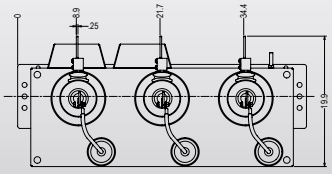
SmartClose Specifications	15kV	25kV
Rated Maximum Voltage, Phase to Phase, for Ungrounded Banks, kV, RMS	15.5	27.6
Impulse Withstand Voltage, kV, B.I.L.	110	125
Terminal-to-Ground Creep Distance, inches(mm)	18(457)	18(457)
Terminal-to-Terminal Creep Distance, inches(mm)	19(482)	19(482)
Low Frequency Insulation Level Withstand		
1 Minute Dry, kV	60	70
1 Minute Wet, kV	50	60
Continuous Current, Amps	200/400	200/400
Capacitive Switching Current, Amps	200/400	200/400
Fault Making Current Rating, Amps, Peak Assymetrical	32500	32500
Short Time Current Rating, 1 second, Amps, RMS	12500	12500
High Frequency Transient Making Current, Amps, Peak, at 6kHz	16000	16000
Operating Voltage Range, VAC 50/60Hz, +/-15%	120 or 240	120 or 240
Operating Current Rating, Amps	8/4	8/4
Close Command Input Voltage pulse (>90mS), AC or DC	40 to 150	40 to 150
Open Command Input Voltage pulse (>90mS), AC or DC	40 to 150	40 to 150
Environmental Operating Temperature, °C, Standard	-30 to +65	-30 to +65
Environmental Operating Temperature, °C, Optional	-50 to +65	-50 to +65
Maintenance Free Operations	30000	30000
Oil Free, Solid Dielectric	Yes	Yes
Restrike Performance, 0 restrikes	C2	C2
ANSI Test Standard	C37.66-2005	C37.66-2005
Weight, Lbs., (kg)	195(88)	195(88)

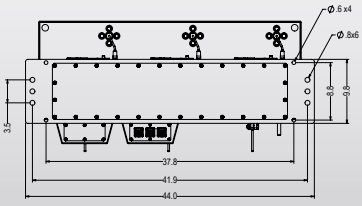
Standard Options:

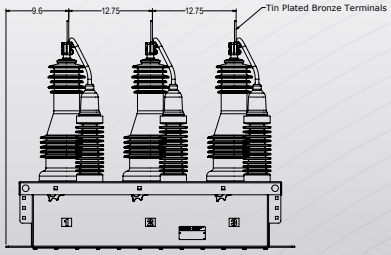
- Open with loss of power (>10 cycles)
- 5 minute close inhibit after trip
- Factory Zero Close Calibaration
- Aux Contacts, 15A @ 120VAC, Form A and Form B, 1 Per Pole

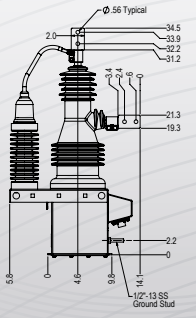
Built on the performance-proven UltraVac Series solid dielectric vacuum interrupter platform, Trinetics® SmartClose capacitor switches deliver zero volt closing within 800 millionths of a second.

Dimensions:









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ISO 9001:2008 CERTIFIED AS 9100:2004