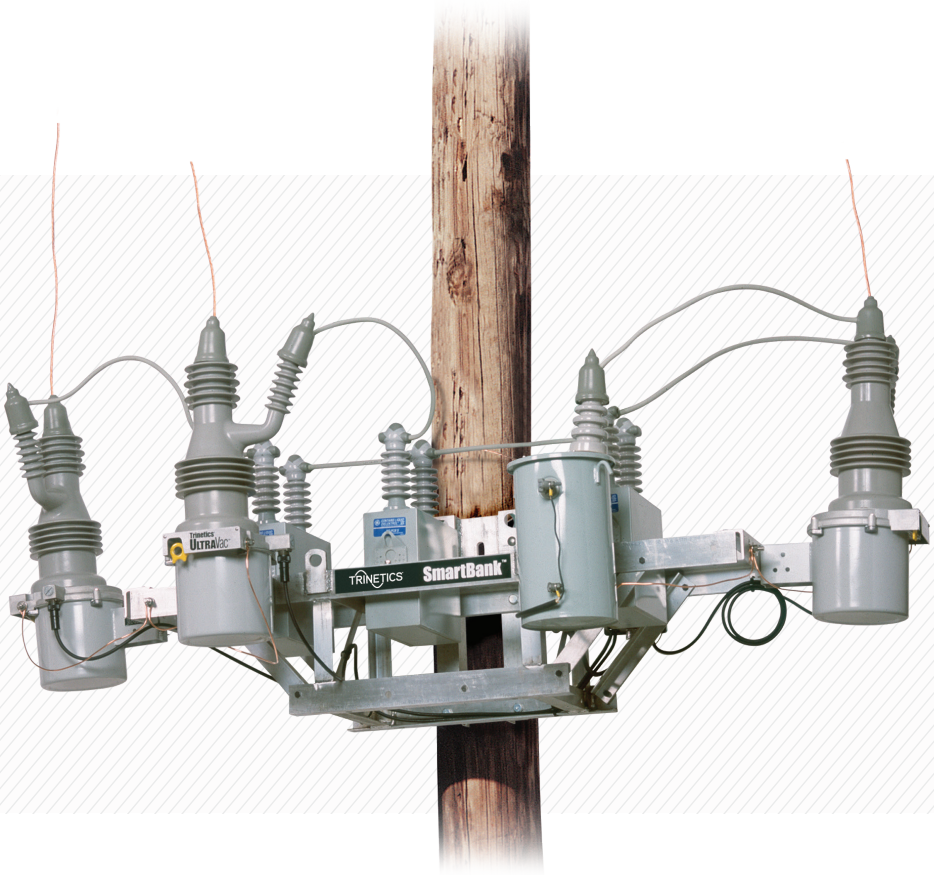
Hubbell® **Standard Pole Mount Capacitor Banks**

Hubbell Power Systems, Inc. (HPS) presents the Trinetics Power Factor Correction Solutions

Easy Ordering
More Value
Less Guesswork



HUBBELL

Introduction

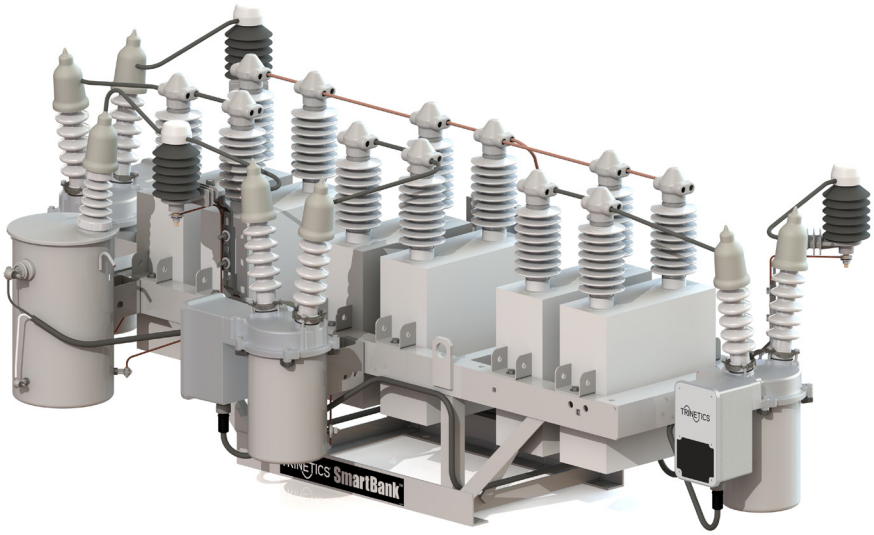
Hubbell standard capacitor banks (standard banks) offer a reliable and comprehensive pole-mount capacitor rack solution that meets the needs of electric cooperatives and public power utilities.

Our standard banks are designed to simplify the ordering process by providing easy selections for customers, and covering most of the common requirements for a pole mount power factor correction solution.

Our standard banks are factory assembled, pre-wired and are delivered ready for immediate field installation, including the wildlife protectors as a standard offering.

The Hubbell Standard Capacitor Bank offers customers the following benefits:

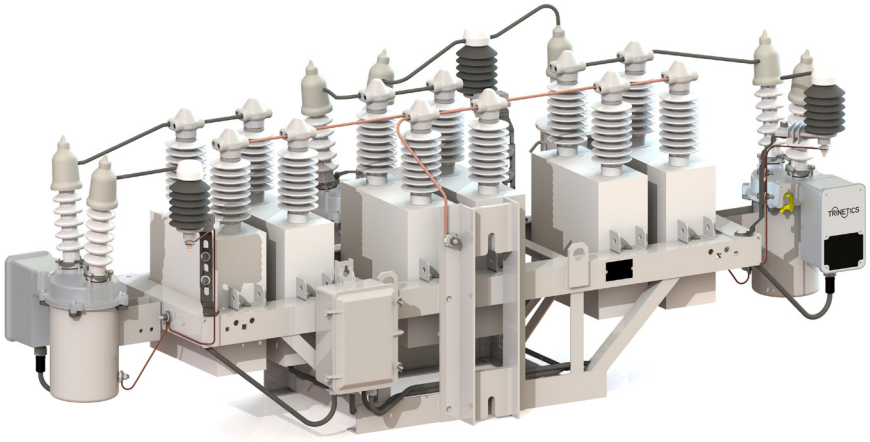
- Improved power factor
- Voltage regulation
- Reduced losses
- Release of system capacity
- Improved power flow
- Cost savings

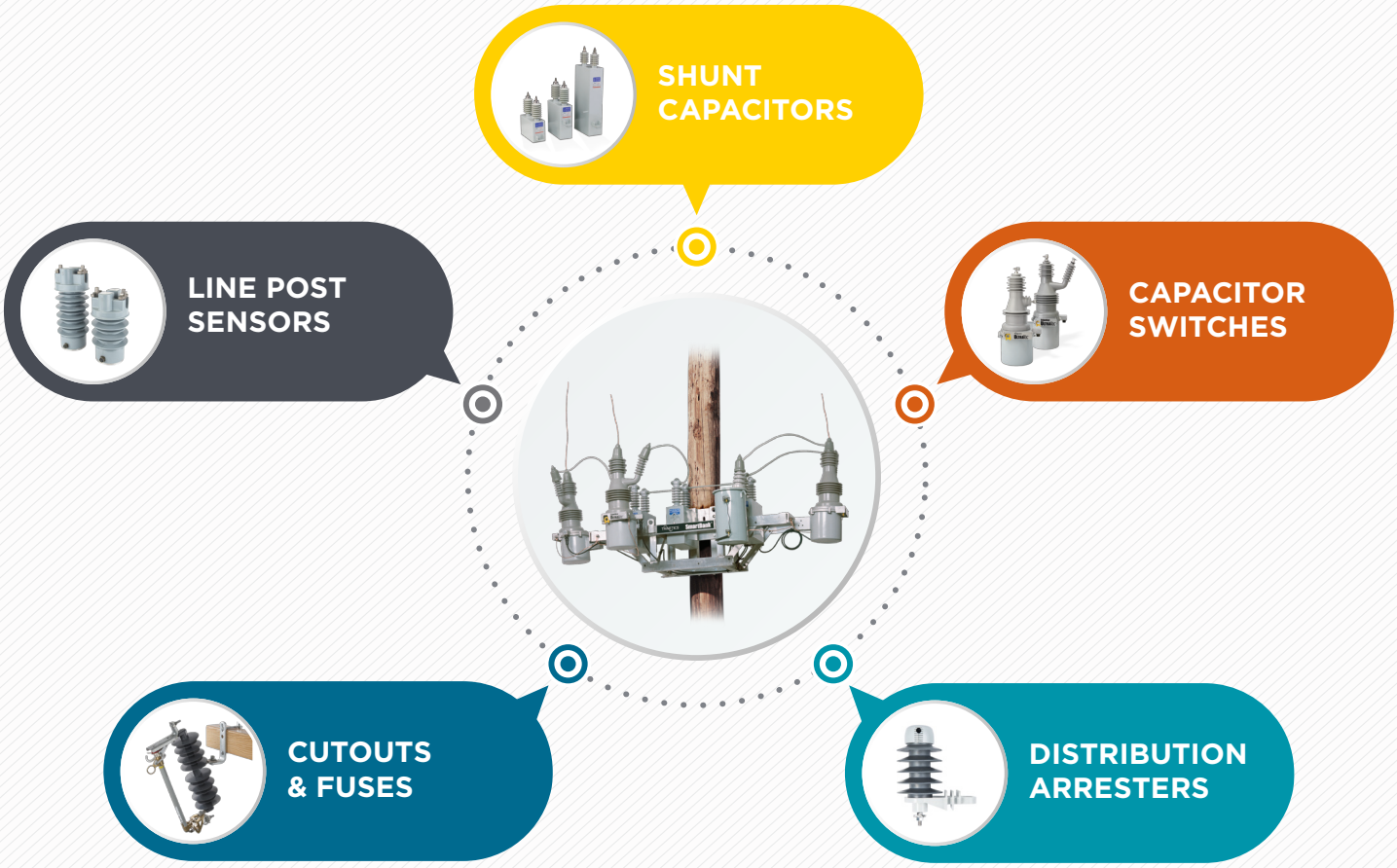


Images showing Hubbell standard capacitor bank with TRINETICS® capacitor frame, Six TRINETICS shunt capacitors, three CSD oil switches, OHIO BRASS® Arresters, CPT and aluminum junction box

Front Isometric View

Back Isometric View





One Hubbell Power Factor Correction Solution

The Hubbell® Standard capacitor banks are designed for a grounded-wye system covering the most common distribution voltages of 12470V / 95kV BIL and 24940V /125kV BIL (operating voltages indicated are L-L).

Our standard banks offers options such as your choice of No capacitor switches (for a fixed bank), CSD oil switches, VS series vacuum switches or UltraVac solid dielectric vacuum switches. The standard cap bank also offers selections for Control Power Transformer, Hubbell line post current sensors, neutral current sensors, OHIO BRASS® PDV100-Optima arresters, junction boxes, meter sockets and capacitor bank controllers.

This “One Hubbell” PFC solution brings together high-quality Hubbell products in a standard, easy-to-order package that best suits the needs and demands of the public power and electric cooperative customers.

Standardization in our design and components allows for a streamlined manufacturing process and shorter lead-times for delivery. You make simple selections based on your system parameters and we offer an economical, turnkey capacitor bank solution for your application!

TRINETICS® Shunt Capacitors

Hubbell Power Systems, Inc (HPS) family of TRINETICS shunt power factor capacitors incorporate features for top performance and high field reliability.

Features and Benefits

- 409 series stainless steel case
- Finish allows superior heat dissipation and offers excellent protection against corrosion in outdoor environments
- Epoxy primer and two coats of polyurethene top coat
- High current withstand capability
- Standard 2 bushing, externally fused design
- Conforms with IEEE-18/IEC60871-1

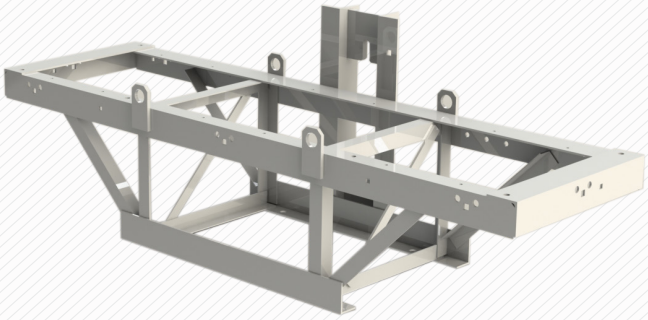
Technical Specifications

Applicable standards:	IEEE-18/IEC60871-1
Phases:	1 Ph
Rated frequency:	60Hz
Fuse protection:	Externally fused
Dielectric type:	All polypropylene film
Impregnating oil:	Non-PCB, non-toxic oil
Ground connection:	Unpainted area under mounting bracket
Case material:	Stainless steel 409 series/CRCA
Paint:	Gray ANSI-70 polyurethene paint suitable for outdoor application

For more information on the TRINETICS Shunt capacitor, please refer to Brochure BR_10_204_E.

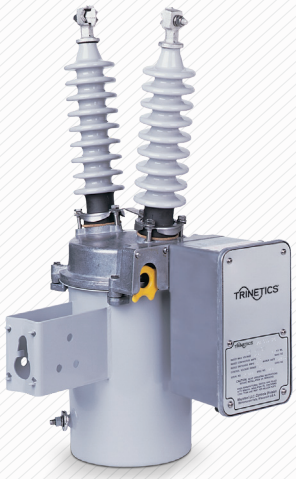
TRINETICS Capacitor Bank Frame

- Heavy-Duty, fully welded 6061-T6 aluminum frame designed for maximum structural integrity for pole mounting application.
- The frame is free-standing, self-supporting stand for ground staging and transport and accommodates up to 6 capacitors, 3 switches, the junction box, and CPT.
- 4 solidly welded lifting eyes for balanced lift. The rack can accommodate bolt spacing from 15.75” – 18.75”.



TRINETICS® Capacitor Switches

HPS offers a variety of options for Capacitor Switches ranging from our oil type capacitor switch to the most advanced and high-technology synchronous zero-close capacitor switch in the market. With more than 50 years of experience in manufacturing capacitor switches, TRINETICS switches exceed IEEE C37.66 and set the standard for reliability, flexibility and durability in the market.



CSD Oil-Type Switches

The TRINETICS legacy CSD oil-type switches offer a time-proven and industry-tested product design that provides a cost-efficient solution to capacitor bank switching. The motor operated CSD switches are the most economical solution for capacitor bank switching.

Standard CSD Options

- CSD, 15kV, 95kV BIL – PN: 33050001
- CSD, 20kV, 125kV BIL – PN: 33184601

**Please refer to Brochure BR_10_207_E for more information on the TRINETICS CSD Oil-Type Capacitor Switches.*

VS Vacuum Under Oil Switches

The TRINETICS VS vacuum Switches are high-performance and time-proven designs, available for system applications up to 34.5kV grounded wye. The motor operated VS switches provide more mechanical operations with lesser maintenance at an economical price.

Standard VS Options

- VS, 15kV, 95kV BIL – PN: 33184401
- VS, 24kV, 125kV BIL – PN: 33195601

**Please refer to Brochure BR_10_206_E for more information on the TRINETICS VS - Vacuum Under Oil Capacitor Switches.*

UltraVac® Solid Dielectric Switches

TRINETICS UltraVac switches are the best-in-class solid dielectric capacitor switches designed for high reliability and long life. The solenoid operated UltraVac switch offers the greatest number of mechanical operations with no maintenance and industry leading C2 re-strike free performance suited for advanced capacitor switching applications.

Standard UltraVac Options

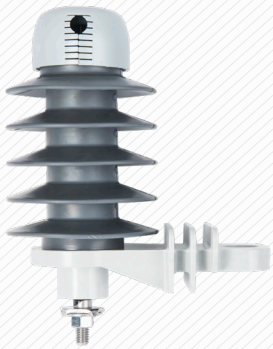
- UltraVac, 15kV, 110kV BIL – PN: 33247102
- UltraVac, 24kV, 125kV BIL – PN: 33247202

**Please refer to Brochure BR_10_205_E for more information on the TRINETICS UltraVac Solid Dielectric Vacuum Capacitor Switches.*

Technical Specifications

Specifications	CSD - Motor		VS - Motor		UltraVac - Solenoid	
Product	CSD-15	CSD-20	VS-15	VS-24	Ultra-15	Ultra-24
Rated Maximum Voltage, kV RMS	15	20	15	24	15	27
Nominal Voltage Class, kV RMS	14.4	19.9	14.4	22.9	26.8	41.5
Impulse Withstand Voltage, kV BIL	95	125	95	125	110	125
Continuous Current, Amps	200	90	200	200	200	200
Number of Operations without maintenance	2,000		10,000		50,000	
Operating Voltage Range, VAC 50/60 Hz	100 to 130		100 to 130		96 to 140	
Operating Current Rating, Amps	2.8		2.8		9	
Switch Operating Time, Seconds (Average/Max.)	2.5 / 4.0		2.5 / 4.0		0.1	
Weight, Pounds	37	39	45	45	45	45

Mid-Central CPT shown courtesy of Mid-Central Electric, Inc.



Control Power Transformer

The Hubbell Standard Capacitor Banks are offered with options for control power transformers (oil filled) depending on the system voltage and the type of capacitor switch.

The CPTs are mounted on the capacitor rack and are chosen for optimal performance and power requirements of the switches, controller and powering any communication modules to be used by the customer.

These fixed-load transformers meet IEEE standards and are smaller in size, economical and have low operating losses.

Cutouts & Fuses

Hubbell cutouts are tested with our own line of CHANCE® fuse links at all standard specified fault ratings.

- Polymer compliant to IEEE C37.41-2016
- Synthetic fuse tube liner provides superior longevity in the field to standard Bone Fiber
- Link break, load break, and cutout arrester combinations available to meet any overhead fusing application

Please refer to Catalog 10AA and 10B on the Hubbell Power Systems Literature Page for detailed information on Hubbell Cutouts & fuse links.

Note: Cutouts and Fuses should be ordered as a separate item based on the system requirements and is not packaged along with the Hubbell standard capacitor bank

Hubbell PDV-100 Optima Arresters

- Over 30 years of excellent field performance with more than 36 million distribution arresters installed
- Long lasting ESPTM housing material with superior mechanical strength and electrical characteristics
- Reliable capacitive disconnector operates at fault currents as low as 1 Amp

Arrester Housing	ESP™ (Enhanced Silicone Polymer)
Arrester Type	Heavy Duty (IEEE), Distribution High (IEC)
Mounting	Insulating Base Bracket with Capacitive Disconnector
Design Standards	IEEE C62.11, IEC 60099-4 Ed. 3

Standard Arrester for Capacitor Bank

- For 7200 V (L-G) system, PDV-100 Optima, 7.65 kV MCOV – PN: 2137087314
- For 14400 V (L-G) system, PDV-100 Optima, 15.3 kV MCOV – PN: 2137157314

****Please refer to Catalog 70 under the Hubbell Power Systems Literature page for more information on the PDV-100 Optima Heavy-Duty Arresters.***

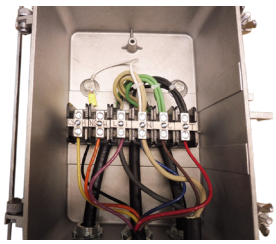
Junction Box & Meter Socket Assembly

Our standard banks are offered with three options for junction boxes and meter sockets.

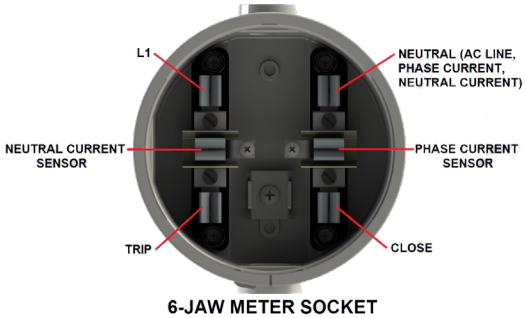
- No Junction box or meter socket (for fixed banks)
- Aluminum junction box only
- Aluminum junction box and 6-jaw meter socket

The aluminum junction box and the 6-jaw meter socket can be used with the capacitor bank controller for time, temperature, voltage, kVAR, watts, phase current, neutral current and PF based control schemes.

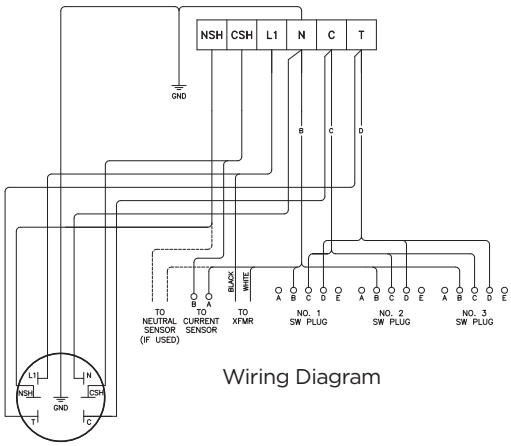
The standard junction box and meter socket assembly is provided with a 30ft signal cable.



Aluminum Junction Box



6-JAW METER SOCKET



Wiring Diagram

QEI ECap II controller shown courtesy of QEI, Inc.

Example of neutral sensor shown courtesy of HD Electric Co.

Capacitor Bank Controller

The Hubbell Standard Capacitor Banks offer options for including capacitor bank controllers from QEI Inc (MCap II and ECap II). The controllers offer a variety of features and functionality with an easy-to-use interface and integrates seamlessly with the Hubbell Capacitor Banks.

Features and Benefits

One unit for all Switching Strategies, seasonal or all year

- Voltage, amps, VARs, power factor, watts
- Time, temperature & day of week

Overrides, Seasonal and Global

- Reverse power
- Neutral current/voltage
- Max operations per day
- Emergency voltage
- Day of week (DOW) override

Easy to use, forms-based configuration software

- Compatible with Windows 7 & 10

High Reliability

- Non-metalic, non-conductive NEMA 4X enclosure
- Front accessible fuses - protect surge through cap bank terminals
- Rugged "SuperCap" backup (instead of a battery) to maintain the internal clock

Flexible SCADA Communications (eCAP II)

- DNP3, modbus
- Radio, cell, modem
- SCADA override and inhibit to coordinate local and remote control functions

Note: This controller is to be ordered and installed on the 6-Jaw Meter Socket.

Please contact TRINETICS Marketing for packaging communication/radio modules and antennas with the controllers for SCADA Comms.

Hubbell® Line Post Sensors

Hubbell Power Systems, Inc. line post sensors are designed for 15kV, 27kV and 35kV outdoor pole or structure mounting applications. These sensors are used to measure voltage, current, or both, and provide a low voltage output proportional to the primary voltage or current being measured.

Features and Benefits

- Ultra-Light weight design with "swing-style" conductor clamps and lay-in saddle for easy installation.
- Cycloaliphatic epoxy material (CEP)– better insulator
- Best in Class highest leakage distance for high contamination environments.
- Low energy analog outputs (LEA) – Safety (compared to CT design)

Standard Options

- 15kV, 110kV BIL, 600A:10V, CMI PN: PSC82011100
- 25kV, 150kV BIL, 600A:10V, CMI PN: PSC82012100
- Sensors are included with signal cable, 15ft, Twisted Pair & Shielded Cable for CMI PN: PSC82021115

Technical Specifications - Line Post Sensor

Rating (kV L-L)	15, 27
BIL Rating (kV)	110, 150
Sensor Output Ratio	600A:10V, Produces 1V for 60A primary current
Leakage Distance (in)	23.2, 35.4
Accuracy	± 1%, (Phase Shift - 0° nominal, ± 1.5°)
Mounting	3/4 inch Center Pin for Cross Arm Mounting
Weight (lbs)	17, 21
Signal Cable	Twisted Pair and Shielded Instrumentation Cable

Neutral Current Sensor

The Hubbell Standard Capacitor Banks are provided with the option of a Neutral Current Sensor for measuring neutral current. The neutral conductor is passed through the center of the sensor before it connects to system neutral or ground.

Technical Specifications

- Type: closed toroidal or split core
- Output: 0.092V/A, 60Hz AC, 1-100 Amps
- Output Impedance: 6.2kΩ
- Accuracy: ±1%
- Cable: UL Instrumentation, 1 Pair 18AWG (7x26) Bare Copper, PVC-NYL Insulation E2 color code, overall foil shield, black PVC outer jacket, 600V

TRINETICS

Hubbell Standard Cap Bank Ordering Information:

Digits	1-2	3-4	5-6	7	8	9	10	11	12	13	14-16	17	18
Code	PB	03	G9	Y	S	C	Y	Y	6	X	STD	2	1

HIGHLIGHTED digits require customer selections. The other digits (Digits 1,2,7,8,13,14,15,16) are fixed.

Digits 1-2: Capacitor Bank Type

Option	Code
Pole Mount Capacitor Bank	PB

Digits 3-4: Total Capacitor Bank Size (kVARs)

Option	Code
150 kVAR*	01
300 kVAR	03
450 kVAR*	04
600 kVAR	06
900 kVAR*	09
1200 kVAR*	12

**Note: Highlighted options only available for 12470V / 7200V system. Code "03" & "06" available for both 12470V / 7200V and 24940V / 14400V system.*

Digits 5-6: System Voltage & BIL Rating

Option	Code
12470V (L-L) / 7200V (L-G), 95kV BIL	G9
24940V (L-L) / 14400V (L-G), 125kV BIL	U2

Digit 7: Distribution SystemConnection Type

Option	Code
Grounded Wye	Y

Digit 8: Capacitor Bushings

Option	Code
Standard 2 Bushing Capacitors	S

Digit 9: Capacitor Switch Type

Option	Code
No Capacitor Switch (Fixed Bank)	X
CSD Oil Capacitor Switch	C
VS Vacuum Under Oil Capacitor Switch	V
UltraVac – Solid Dielectric Switch	S

Digit 10: Arresters

Option	Code
Yes	Y
No	X

** Please see the Resources tab on hubbellpowersystems.com to access literature referenced in this document..*

Digit 11: Control Power Transformer

Option	Code
Yes	Y
No	X

Note: The selection of the CPT will depend on the system operating voltage and the type of capacitor switch.

Digit 12: Meter Socket & Junction Box

Option	Code
No Junction Box & Meter Socket (Fixed Bank)	X
Aluminum Junction Box Only	J
Aluminum Junction Box (30' cable) + 6-Jaw Meter Socket	6

Note: Please refer to Junction Box and Meter Socket section on the brochure for more information (description, drawings and wirings).

Digit 13: Reactors

Option	Code
Standard Option – No reactors	X

Digit 14-16: Hubbell Standard Cap Bank Product

Option	Code
Hubbell Standard Cap Bank Offering	STD

Digit 17: Capacitor Bank Controller

Option	Code
No Controller	X
QEI M-Cap II Controller (No SCADA Communication)	1
QEI E-Cap II Controller (With SCADA Communication)	2

Digit 18: Sensor Options

Option	Code
No sensors	X
Hubbell Line Post Current Sensor Only	1
Neutral Current Sensor Only	2
Both Hubbell Line Post Current Sensor & Neutral Current Sensor	3

Please contact TRINETICS Marketing (or) your local Hubbell sales representative for other operating voltages, capacitor kVAR sizes or any other custom configurations in pole mount or pad mount capacitor bank solution.

The Hubbell Standard Capacitor Banks are currently available for 120V secondary/60Hz only.

Please note that lead times may vary depending on the availability of components and the order quantity.

HUBBELL

hubbellpowersystems.com

For product inquiries, please contact trinetics-marketing@hubbell.com (or) contact your local sales representative or customer service representative.