

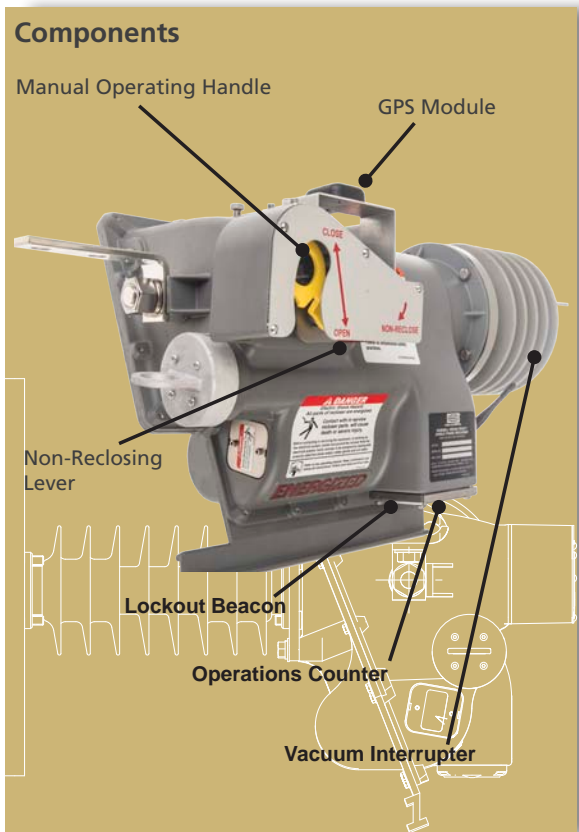


# Versa-Tech<sup>®</sup> II Recloser

Catalog 10EE January 2014

# Versa-Tech® II Recloser

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>One size fits all design                             <ul style="list-style-type: none"> <li>&gt; 29.3kV, 125kV (BIL) rated</li> <li>&gt; 400 Amp continuous and 8kA interrupting</li> <li>&gt; User settable 30 to 800 Amp Minimum Trip</li> <li>&gt; 11 selectable Time Current Curves (with modifiers), 5 IEEE and 5 IEC curves (with vertical multipliers), and 4 user programmable curves</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Reduced inventory requirements</li> </ul>
<ul style="list-style-type: none"> <li>Self contained control and vacuum interrupter</li> </ul>	<ul style="list-style-type: none"> <li>Compact size</li> <li>Lightweight, easy to install</li> <li>Environmentally friendly, no oil</li> <li>Reduced dielectric issues</li> <li>Increased lightning immunity</li> <li>No grounding required</li> </ul>
<ul style="list-style-type: none"> <li>Self-powered, 5 year minimum life battery</li> </ul>	<ul style="list-style-type: none"> <li>No auxiliary power required</li> <li>Lockout beacon</li> </ul>
<ul style="list-style-type: none"> <li>GPS Time Stamping</li> </ul>	
<ul style="list-style-type: none"> <li>Communication options: Cell, WiFi, or Radio</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced communications capability, including long range communications</li> </ul>
<ul style="list-style-type: none"> <li>SCADA DNP3 communication via VersaTech Terminal Unit</li> </ul>	<ul style="list-style-type: none"> <li>Ability to interface with SCADA system</li> </ul>
<ul style="list-style-type: none"> <li>Enhanced recording features                             <ul style="list-style-type: none"> <li>&gt; Fault history</li> <li>&gt; Load monitoring; Real time feedback of line current</li> <li>&gt; Programmable diagnostic events log</li> <li>&gt; Programmable log of recloser activity</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Greater user knowledge of system and recloser conditions</li> </ul>
<ul style="list-style-type: none"> <li>Security features per IEEE 1686-2007</li> </ul>	<ul style="list-style-type: none"> <li>Enhanced customer cyber security</li> </ul>
<ul style="list-style-type: none"> <li>Firmware release compliant with IEEE C37 231-2006</li> </ul>	<ul style="list-style-type: none"> <li>Reduced customer concern with firmware errors</li> </ul>



## Description

The new Versa-Tech® II Recloser is the Second Generation of our innovative Versa-Tech. Building on that foundation, it is an electronically controlled switch configured through a User Interface (UI) and introduces a number of new features including WiFi communication along with SiFLEX radio and serial communications. It also has new long range communications capabilities via cell modem. SCADA DNP3 communications is achieved with the use of a Versa-Tech Terminal Unit (VTU). Other new features include new TCC (Time Current Curves) options, enhanced system and diagnostic information, and improved cyber security features.

## Magnetic/vacuum-interruption technology

Fault interruption occurs in the recloser's vacuum interrupter. The vacuum interrupter's state-of-the-art contacts utilize axial magnetic fields to interrupt in diffuse mode for maximum interrupter life. The vacuum interrupter is supported by an insulating support housing with bonded cycloaliphatic epoxy over-molding for maximum weather resistance.

The drive for the vacuum interrupter is provided by a mechanism with a magnetic actuator. The actuator's rare-earth neodymium magnet provides the latching and holding force for the vacuum interrupter in the closed position. A spring provides the pressure to hold the vacuum interrupter in the open position. Together, the rare-earth magnet and the spring arrangement allow the mechanism to be stable in the open or closed position without the need for external power. To open the vacuum interrupter, a coil on the magnetic actuator is pulsed in one direction. To close,

the same coil is pulsed in the other direction. Energy to open and close the recloser is provided by a set of capacitors.

## Microcontroller electronic control

The control for the recloser is provided by a microcontroller-based electronic circuit. The control's design allows complete flexibility and user choice of minimum trip, time-current curves and sequencing parameters. Current sensing for the control occurs through a 1000:1 current transformer.

## Self-powered operation

No external transformer power for the recloser is required. Power for the control and the mechanism is harvested from fault or load current using two power current transformers. The open and close capacitors that drive the recloser are charged by the load or fault current through the power current transformers. Using this approach the recloser will continue to open and close as necessary without the need for external power or even the hot-stick replaceable lithium battery pack (exceptions apply, please consult application note "VT2APR0001" available on the Hubbell Power Systems website.).

## Automatic operation

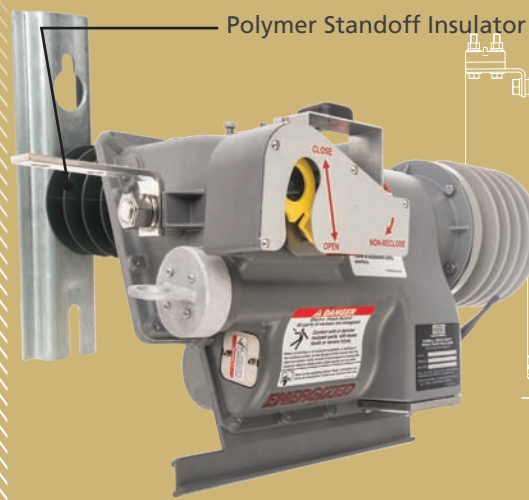
In the closed position, the Versa-Tech® II Recloser, operates automatically per the user-programmed settings.

## Manual operating handle

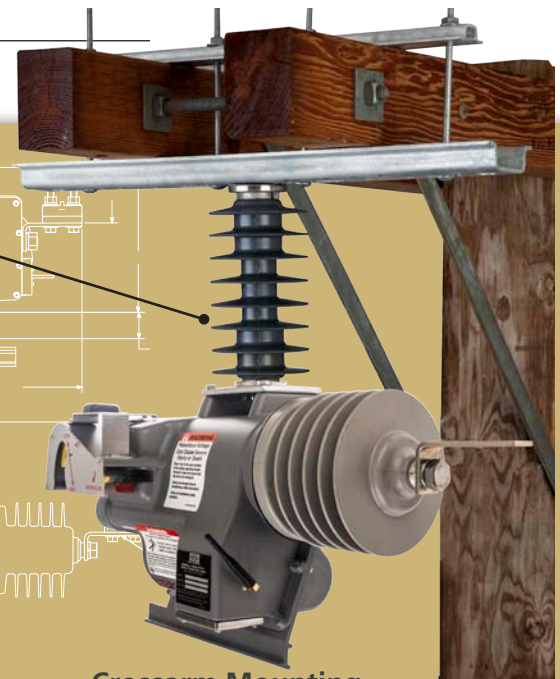
The Manual Operating Handle (yellow handle) allows manual operation of the recloser with a hotstick.

# Versa-Tech® II Recloser

## Installation Alternatives



**Pole/Structure Face Mounting**



**Crossarm Mounting**

### Ratings and Specifications

Rated Maximum Voltage.....	29.3kV
Rated Continuous Current.....	400A
Fault Make Capacity.....	8kA
Fault Make Capacity Peak.....	20.7kA
Fault Break Capacity.....	8kA
Mechanical Operations.....	30,000
3 Second Withstand Current.....	8kA
Transformer Magnetizing Current.....	14A
Cable Charging Current.....	25A
Line Charging Current.....	5A
Lightning Impulse Withstand.....	125kV
60Hz, 1-Minute Withstand Voltage.....	60kV
Maximum Terminal Pad Load kg (pounds).....	14 (30)
Operating Temperature.....	-40°C to 60°C
Weight kg (pounds).....	21 (46)



**Operations Counter**

**Lockout Beacon**

## Non-Reclose/Hot Line Tag lever

The Non-Reclosing Lever (red lever) is shown in its normal (or up) position. The Versa-Tech II User Interface allows the programming of this lever in a dual functionality mode (Non-Reclose/Hot Line Tag) or a single functionality mode (Hot Line Tag Only). When the "Non-Reclose/Hot Line Tag" option is selected, the recloser will be in a Non-Reclose (NR) mode when the lever is rotated to the down position. In the NR mode, the recloser will trip using TCC1 and lockout on any current above minimum trip. If the lever is rotated to the down position twice (up-down-up-down), the recloser is placed in Hot Line Tag mode. The Hot Line Tag mode is an instantaneous trip mode. When the recloser locks out on Hot Line Tag, the unit can be closed only after the Hot Line Tag mode is disabled. This is accomplished by first rotating the Non-Reclose Lever back to its original position (up) and then by pushing the Manual Handle (yellow handle) back to its up position.

When the "Hot Line Tag Only" option is selected, the recloser will always be in Hot Line Tag mode when the lever is placed in the down position.

## Lockout beacon

The Lockout Beacon is a unique feature to aid the utility lineman in identifying a locked out recloser. This high-brightness, sunlight-visible amber LED will flash with a steady on and off blink when the recloser has sequenced to lockout. The beacon will continue to flash until the manual handle is closed back or 4 hours have passed at which time the beacon will shut off. Powered by the recloser's lithium batteries, the beacon's duty cycle is set to have a negligible effect on battery life.

## Operations counter

The Operations Counter is an electromechanical counter which records the number of open operations initiated by the control.

## Global Positioning System (GPS) module

The Versa-Tech II has an integrated GPS module which is used to update the real time clock (RTC) of the internal controller. It is also used to read the latitude, longitude, and the number of satellites in view of the recloser.

**Zero service requirements**

The Versa-Tech® II Recloser has been designed for a minimum mechanical life of 30,000 operations. No routine maintenance is required.

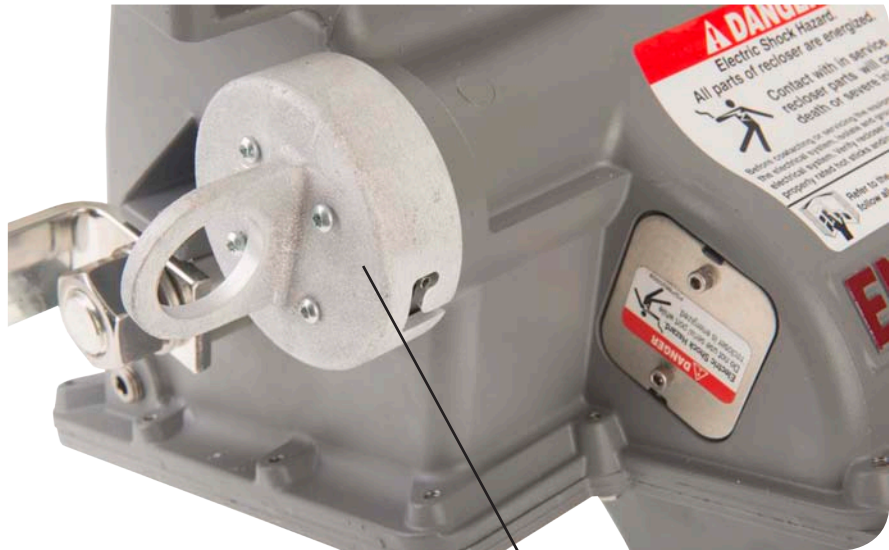
**5-Year battery replacement**

Battery power is used for these functions only:

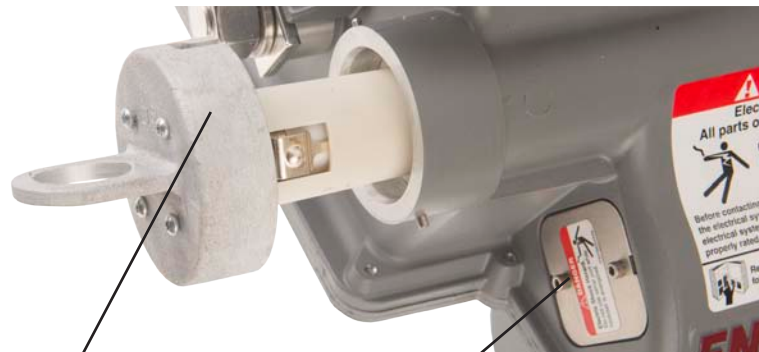
- To close the recloser after installation or lockout
- To power the communication modules if load current is less than 10 amps
- Powering the controller during extended reclose times
- Flashing the beacon.

The battery is made of a very stable lithium chemistry, which is designed with a low self discharge. Hubbell Power Systems recommends that users replace the battery on a 5 year cycle. The battery status can be monitored via the Versa-Tech II Programmer (User Interface) or via the Versa-Tech Terminal Unit (VTU) at the SCADA control station.

The battery bayonet is designed to be replaced using a hot stick while the recloser is in service. The battery bayonet utilizes a twist lock design. It is easily removed by pushing in slightly and turning.



Battery bayonet in the recloser



Battery bayonet partially removed from recloser

Serial Port Cover

**Battery Pack Replacement Kit**

The option to replace the Lithium battery pack inside Versa-Tech battery bayonet is available. Ordering Part No.PSC8620397

**Customer-supplied requirements**

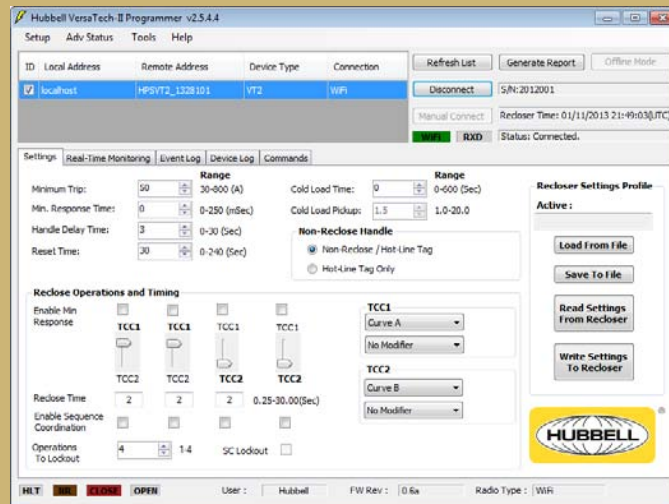
Personal computer with Microsoft® Windows® 7 32/64bit operating system, custom USB serial cable (Part # PSP8620083) if a direct connection to the unit is desired, Mini USB serial cable if direct connect through cell modem is desired, local radio with USB Type B serial cable for connection via the SiFLEX radio, PC wireless card for connection through the WiFi module, cellular network, or Versa-Tech Terminal Unit if SCADA DNP3 communication is desired.

## Easy-to-program controls

The Versa-Tech® II Recloser's solid-state circuitry provides for flexible user-programmable control of minimum trip, TCC times, and all other control functions. The recloser is shipped with generic settings and must be programmed prior to installation with settings required for proper coordination with the rest of the distribution circuit.

## Software installation

The Versa-Tech® II Programming (User Interface) software must be installed on the computer prior to use. Installation software is provided with each recloser on a USB drive or can be downloaded from [www.hubbellpowersystems.com/switching/dist/reclosers](http://www.hubbellpowersystems.com/switching/dist/reclosers)



- Automatic scan of communication ports
- One click radio connect
- One-click report generation
- Status indicators on every screen
- Recloser serial number
- Communication indicators
- Non-reclose and Hot Line Tag status indication
- Battery Status Monitor
- Programmable Events Log
- Programmable Device Log
- Programmable Demand Log
- User-Enabled Inrush Restraint
- Up to 10 User Profiles
- Oscillography
- Audit Log
- GPS Time Stamping

## User-friendly programmable software settings

### Security

The recloser comes with user authentication security on its settings. There are three types of available users: administrator, advanced, and basic user. Up to 10 user profiles can be utilized (2 fixed and 8 programmable) with various permission levels.

### Minimum Trip value

The Minimum Trip Value is the minimum current sensed that will cause the recloser to trip. This value is user configurable from 30A to 800A in 10A increments.

### Sequence Coordination

The sequence coordination feature, if enabled, will prevent unnecessary operations of the recloser when used in a series arrangement upstream from other fault interrupting devices. Shot selectable Sequence Coordination and Lockout on Sequence Coordination options are also available.

### Operations to Lockout

The control can be set to 1, 2, 3, or 4 operations before the recloser goes to lockout.

### Handle Delay Time

The time from when the manual handle is activated until the recloser begins closing the circuit can be programmed from 0 to 30 seconds.

### Time-current curve and time-current curve modifiers selection

The control can be set to utilize two different time current curves TCC1 and TCC2. The Versa-Tech II allows for the selection between 11 legacy curves (with 3 modifiers), 10 standard curves (5 IEEE and 5 IEC) with vertical multipliers and 4 user-defined custom curves. TCC1 and TCC2 can be set separately to use any of these different time current curves. Each of the 4 possible operations can be set to use either TCC1 or TCC2.

### Minimum Response Time

Minimum response time is used to achieve coordination between fault interrupting devices where fault levels would cause two devices in series to both trip. When minimum response is enabled, tripping is inhibited until the minimum response time programmed is less than or equal to the fault current time. The minimum response time is programmable from 0 to 250 milliseconds in 1 millisecond steps.

### Reclose Time

Reclose Time is the amount of time from when the recloser interrupts the overcurrent until the recloser attempts to close the circuit again. Each of the three possible reclose intervals is separately programmable from 0.25 to 30 seconds in 0.05 second increments.

### Reset Time

Reset time is the amount of time from the last reclose until the present count of operations is reset to zero and it is also defined as the amount of time from the last momentary over current event(current above minimum trip) the recloser sees until the timer expires. When the recloser goes to lockout, the count is also reset to zero. Reset time is programmable from 1 to 240 seconds in 1-second increments.

### Cold Load Time

During this programmed interval, the control will be in one operation to lockout mode and overcurrent timing will use TCC2 if unit senses current above Cold Load Pickup. Cold Load Time is programmable from 0 to 600 seconds in 1 second increments.

### Cold Load Pickup

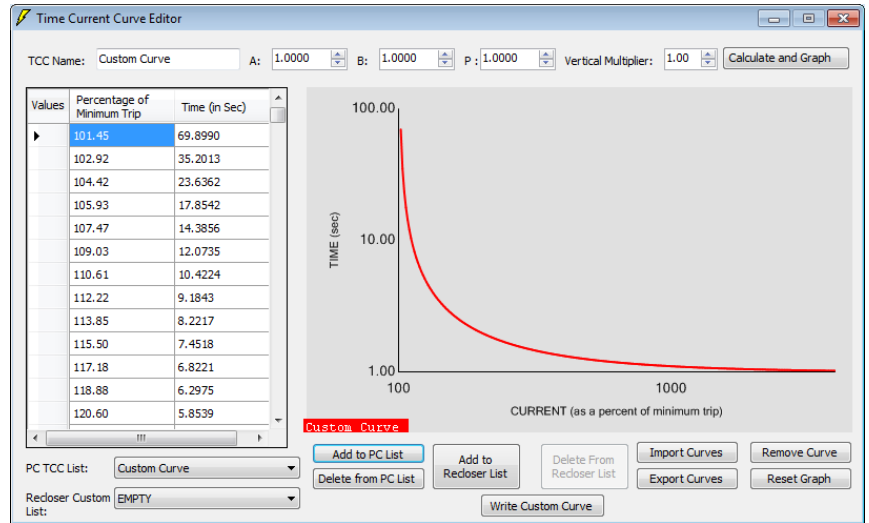
The range of the minimum trip can be elevated by multiplying the minimum trip by the Cold Load Pickup factor during the Cold Load Time. The Cold Load Pickup factor ranges from 1-20 and is programmable in steps of 0.1.

### Time stamp

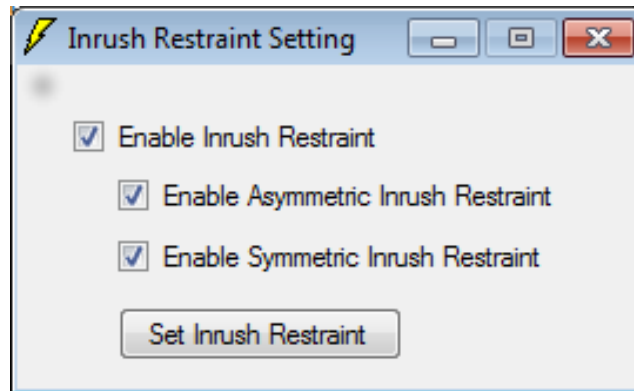
The recloser has a built in time stamp circuit which records the time and date following each recloser operation. The Versa-Tech II also has an integrated GPS module that is used to update the Real Time Clock of the internal controller.

Protection Features

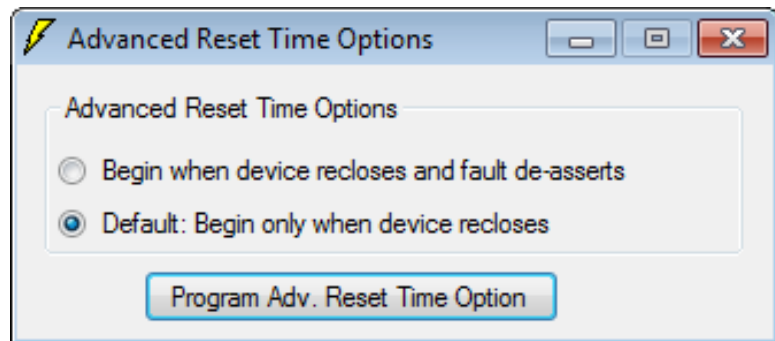
- Time Current Curves - 11 Legacy Curves (with 3 modifiers), 5 IEEE Curves (with vertical multipliers), 5 IEC Curves (with vertical multipliers) and 4 User Programmable Custom Curves (using the TCC Editor)



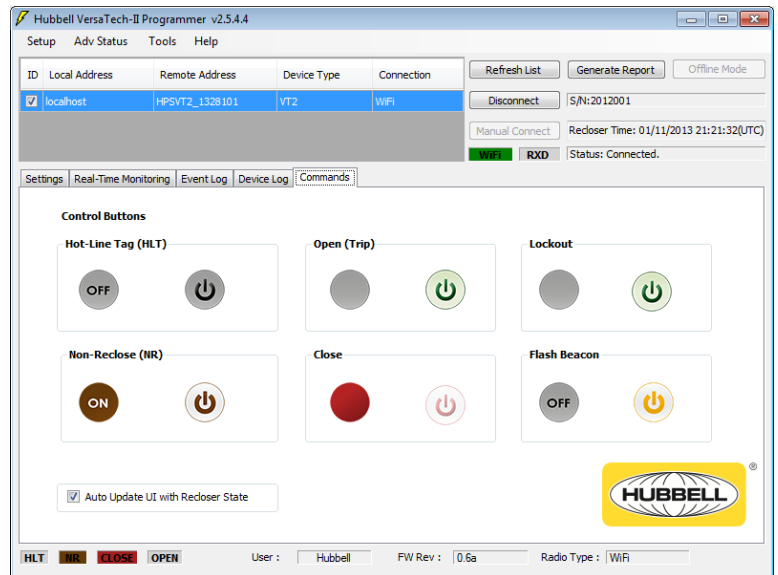
- Programmable Inrush Restraint



- Advanced Reset Time Options



## Remote Commands



- 10 User Profiles (2 fixed and 8 programmable)
- 3 Types of User Account Levels with up to 6 Permission Level

PERMISSION LEVELS	USER LEVELS		
	Administrator	Advanced	Basic
View events and data	✓	✓	✓
View configuration settings	✓	✓	✓
Change configuration settings	✓	✓	
Perform firmware upgrade	✓		
Manage users and passwords	✓		
View audit log	✓		

- Audit Log

Sr. No.	Time	Type	User
01	01/11/2013 15:12:40:265	Protection Settings Successfully Read	Hubbell
02	01/11/2013 15:12:39:840	User Successfully Logged In	Hubbell
03	01/11/2013 15:00:50:070	User Manually Logged Out	Hubbell
04	01/11/2013 15:00:36:805	Protection Settings Successfully Read	Hubbell
05	01/11/2013 15:00:36:320	User Successfully Logged In	Hubbell
06	01/11/2013 14:52:11:180	Protection Settings Successfully Read	Hubbell
07	01/11/2013 14:52:10:705	User Successfully Logged In	Hubbell
08	01/11/2013 14:51:07:665	User Inactivity Log Out	Hubbell
09	01/11/2013 14:48:55:360	Protection Settings Successfully Read	Hubbell
10	01/11/2013 14:48:54:865	User Successfully Logged In	Hubbell
11	01/11/2013 14:46:51:025	Protection Settings Successfully Chan...	Hubbell
12	01/11/2013 14:46:05:075	Protection Settings Successfully Read	Hubbell

Summary of Versa-Tech II (VTII) Protection Features Compared to Versa-Tech I (VTI)		
Features	VTI (FW v3.46)	VTII
Programmable Minimum Trip & Lockout	Yes	Yes
TCC Curves	11 Legacy (3 Modifiers), 4 IEEE	11 Legacy (with 3 Modifiers), 5 IEEE (with Multipliers), 5 IEC (with Multipliers), Up to 4 User configurable custom TCC curves
Shot-specific Sequence Coordination (SC) and SC Lockout	No	Yes
Cold Load Time & Cold Load Pickup	No	Yes
Inrush Restraint	No	Yes (Programmable)
Reset Time	Basic	Available with advanced options
Safety Interlock	N/A	With Yellow (Lockout) Handle down, NO Closing allowed from any source (except Manual Closing)
Hot-Line Tag (HLT)	Not available. (Hot-Line Trip. Allowed closing in HLT mode)	Available
Remote HLT	No	Yes (via VTU & cell modem)
Remote NR	No	Yes (via VTU & cell modem)
Remote Open/Lockout	No	Yes (via VTU & cell modem)
Commands supported from User Interface (UI)	Beacon Flash only (Available only on the units built after July 2011)	HLT, NR, Open, Close, Lockout, Flash Beacon

## Communications

- SiFLEX radio communication option (internal placement)
- WiFi communication option (internal placement)
- Cellular communication option
- SCADA DNP3 communications via Versa-Tech® Terminal Unit
- Direct USB (custom serial cable) communication

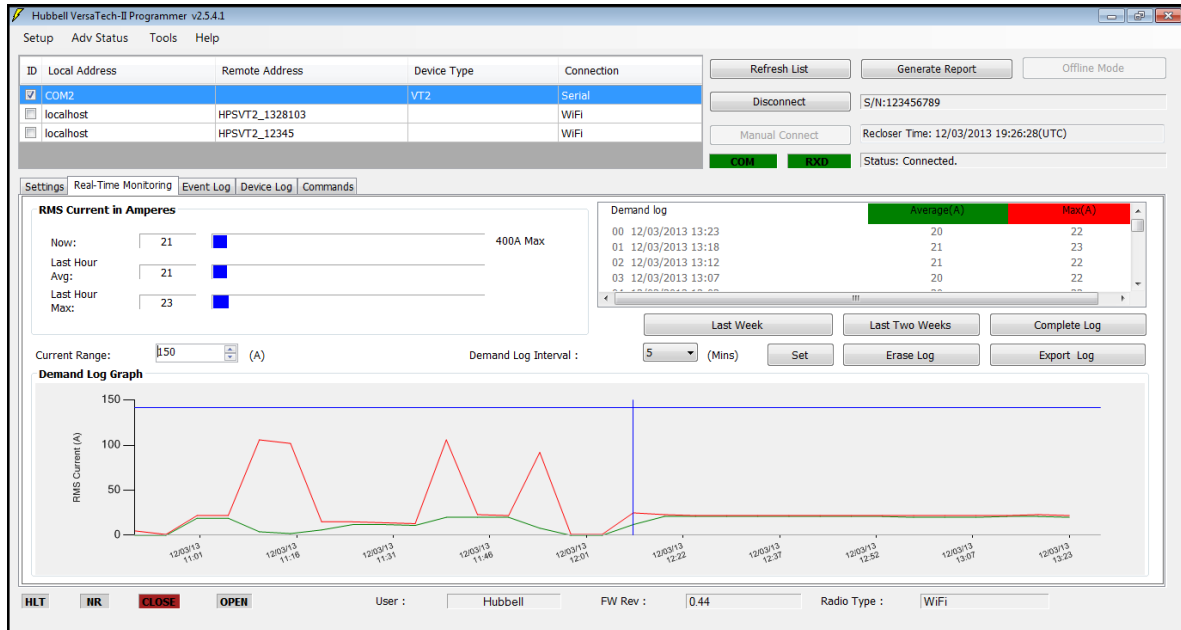
Summary of Versa-Tech II (VTII) Protection Features Compared to Versa-Tech I (VTI)		
Features	VTI (FW v3.46)	VTII
Direct Serial Connect	DB-9 Port	DB-15 port; Mini-USB port available (w/ Cell Modem module)
Digi Radio Support	Yes	No
LSR Radio Support	Yes, External Module	Yes, Internal Module
WiFi Support	Yes, External retrofittable dongle	Yes, Internal WiFi Module
Cell Modem (Remote Monitoring & Control)	No	Yes, with GSM & CDMA options (100% UI Communication support over cell modem including FW Upgrades, Event Log, Device Log, Demand Log)
SCADA (DNP3) Support	No	Yes, via VTU
DNP3 Points (BI, BO, AI, Counters) Support	No	Yes (Please refer to DNP profile document for detailed list)





## Monitoring and Logs

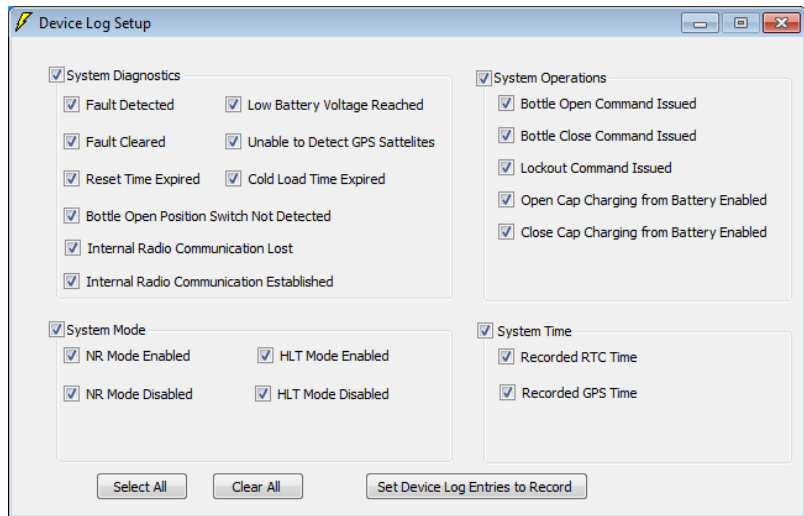
- Real-Time Monitoring and Demand Metering with Programmable Time Constants



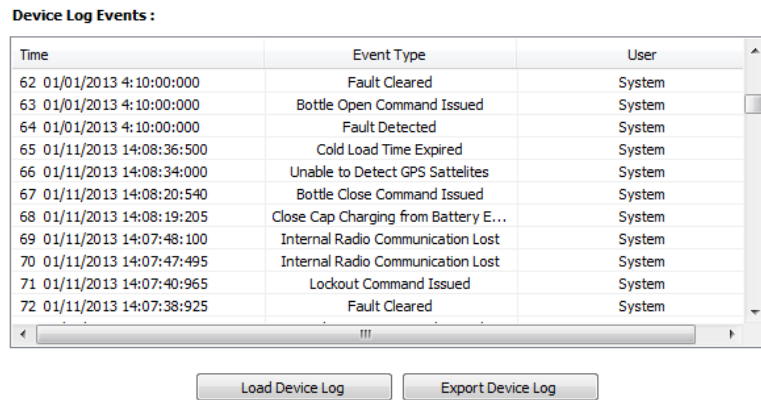
- Programmable Event Log

The screenshot shows the 'Event Setup' dialog box. It contains two main sections: 'Recordable Events' and 'Trip Cycles Setting for Oscillography data'. The 'Recordable Events' section has a list of 14 events, all of which are checked: Overcurrent (OC), Hot-Line Tag (HLT), Non-Reclose (NR), Cold Load Pickup (CLPU), Overcurrent (Low Battery Mode Disabled), Sequence Coordination (SC), Manual Open, Local Open/Lockout, DNP3 Remote Open/Lockout, Cell Modem Remote Open/Lockout, Manual Close, Local Close, DNP3 Remote Close, and Cell Modem Remote Close. Below this list is a 'Program Recordable Events' button. The 'Trip Cycles Setting for Oscillography data' section has a 'Pre Trip Cycles' dropdown menu set to 9 and a 'Program Recordable Pre-Trip Cycles' button. A note at the bottom states: 'Note : Total no. of recordable Pre-Trip and Post-Trip cycles are 12'.

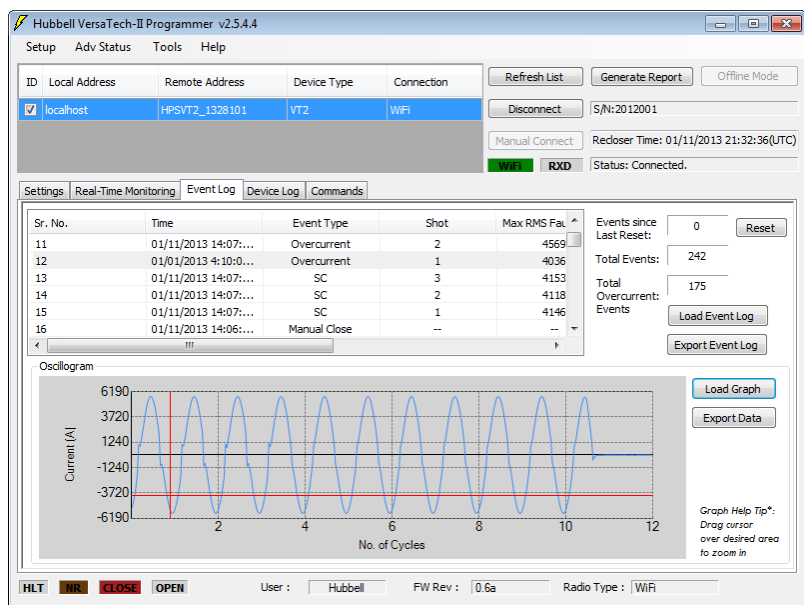
- Programmable Device Log



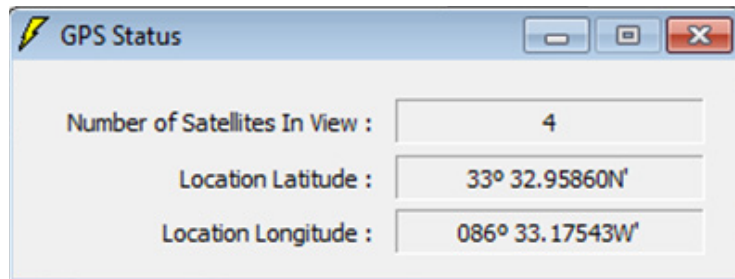
- Recorded Device Log



- Oscillography with User Defined Pre-Trip Cycles

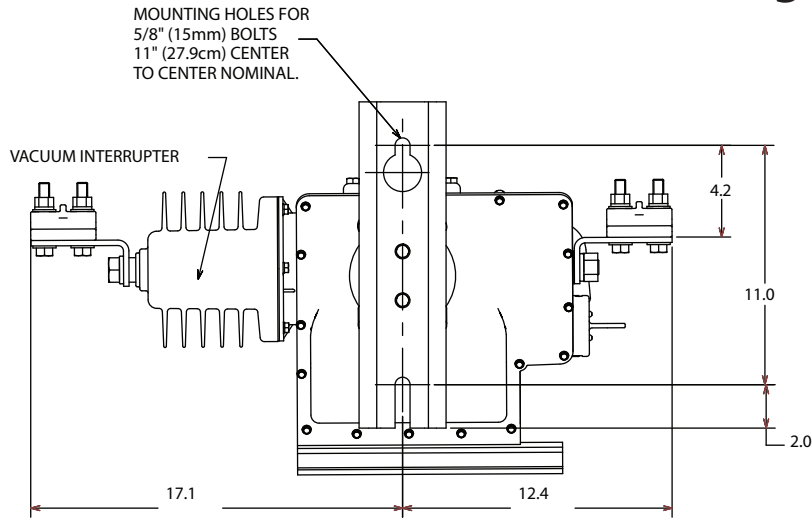


• GPS Status

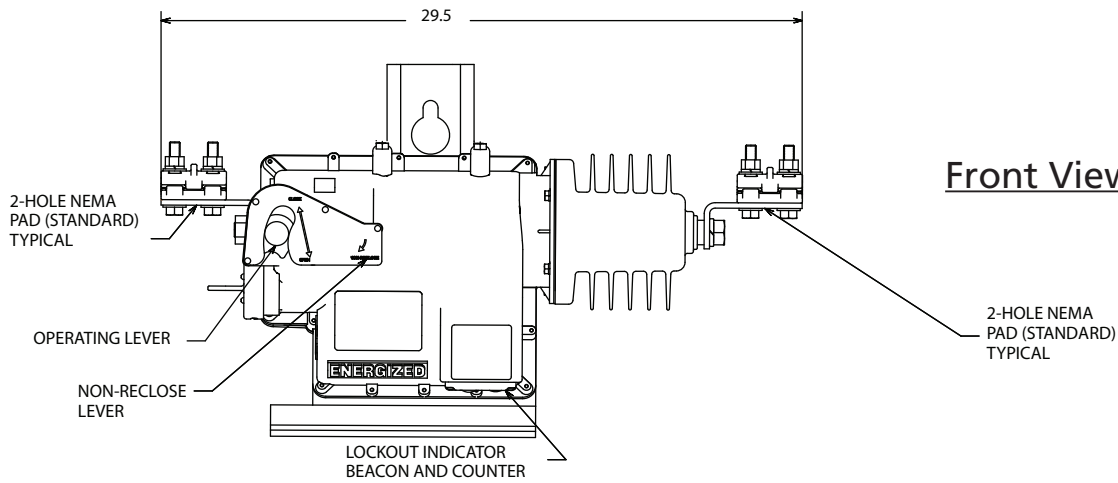


Summary of Versa-Tech II (VTII) Protection Features Compared to Versa-Tech I (VTI)		
Features	VTI (FW v3.46)	VTII
Real-time Load Current Monitoring	Yes, Up to 400 A	Yes, Up to 400 A
Load Profiling (Demand Log)	Non-programmable, Time interval fixed at 60 min. Can record 45-days worth of data logs (total 1080 entries)	Programmable (between 5- 60 min) Can record 90-days of hourly data (total 2160 entries)
Demand Log Graphical Display	Basic	Display available with time and date stamp (zoom-in option available)
Event Log	80 Entries	256 Entries (w/ advanced logging options)
Event Log Setup	Non-programmable	Programmable
Oscillography	Not Supported	Supported; (Programmable pre-trip and post trip cycles) Total 12 cycles can be recorded
Device Log (per IEEE 1686 Cybersecurity Std.)	Not supported	Supported; Programmable device log setup; 1000 Entries
Audit Log (per IEEE 1686 Cybersecurity Std.)	Not Supported	Supported; 2048 Entries
User Profiles (per IEEE 1686 Cybersecurity Std.)	Not Supported	Supported; 2 default users and 8 configurable; User Type is programmable (Basic, Advanced, Admin)
Time Synchronization	RTC only	GPS time stamping available along with RTC
GPS Status	Not Supported	Supported; Shows Latitude, Longitude and Number of Satellites in View
FW Upgrade Capability	Yes; Supported over - Digi, WiFi, Serial.	Yes; Supported over - WiFi, SiFLEX radios & Cell modem.
Battery Status Monitoring	Not Supported	Supported
Recloser Report Format	Available only TXT	Available in XML and PDF

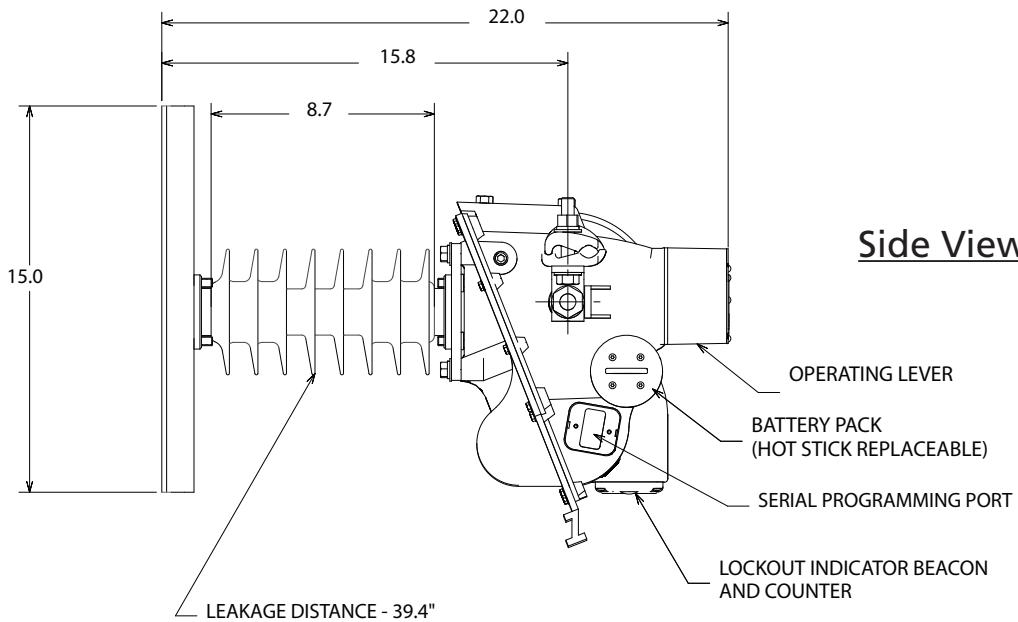
# Dimensions - Pole/Structure mounting



**Back View**

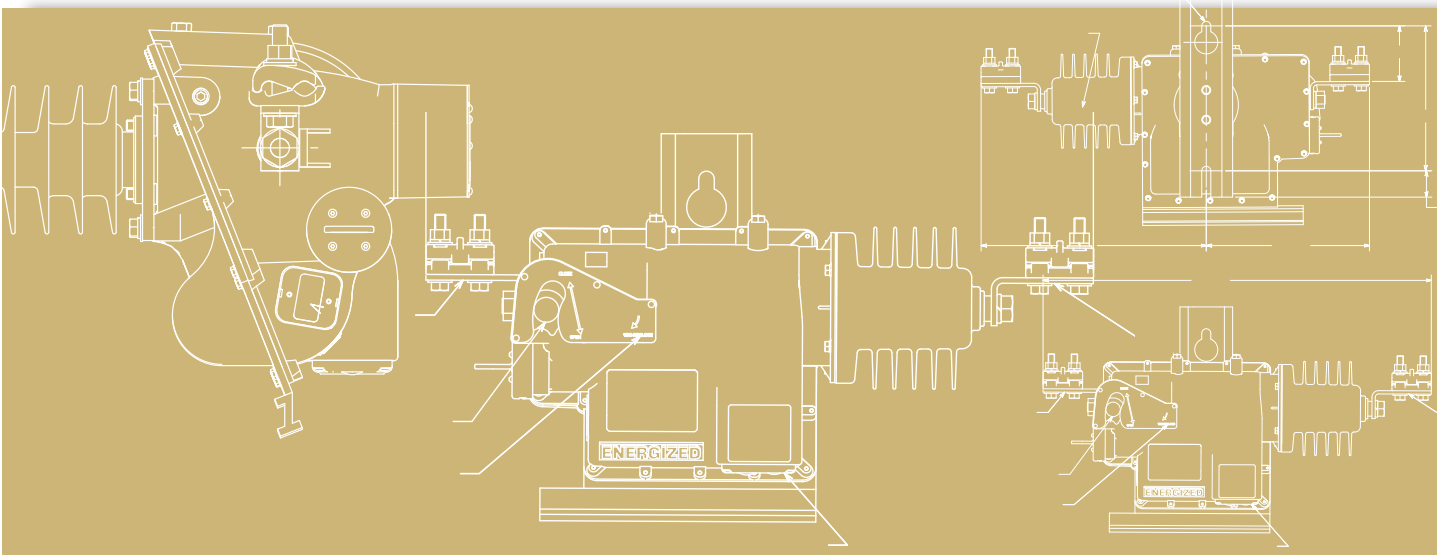
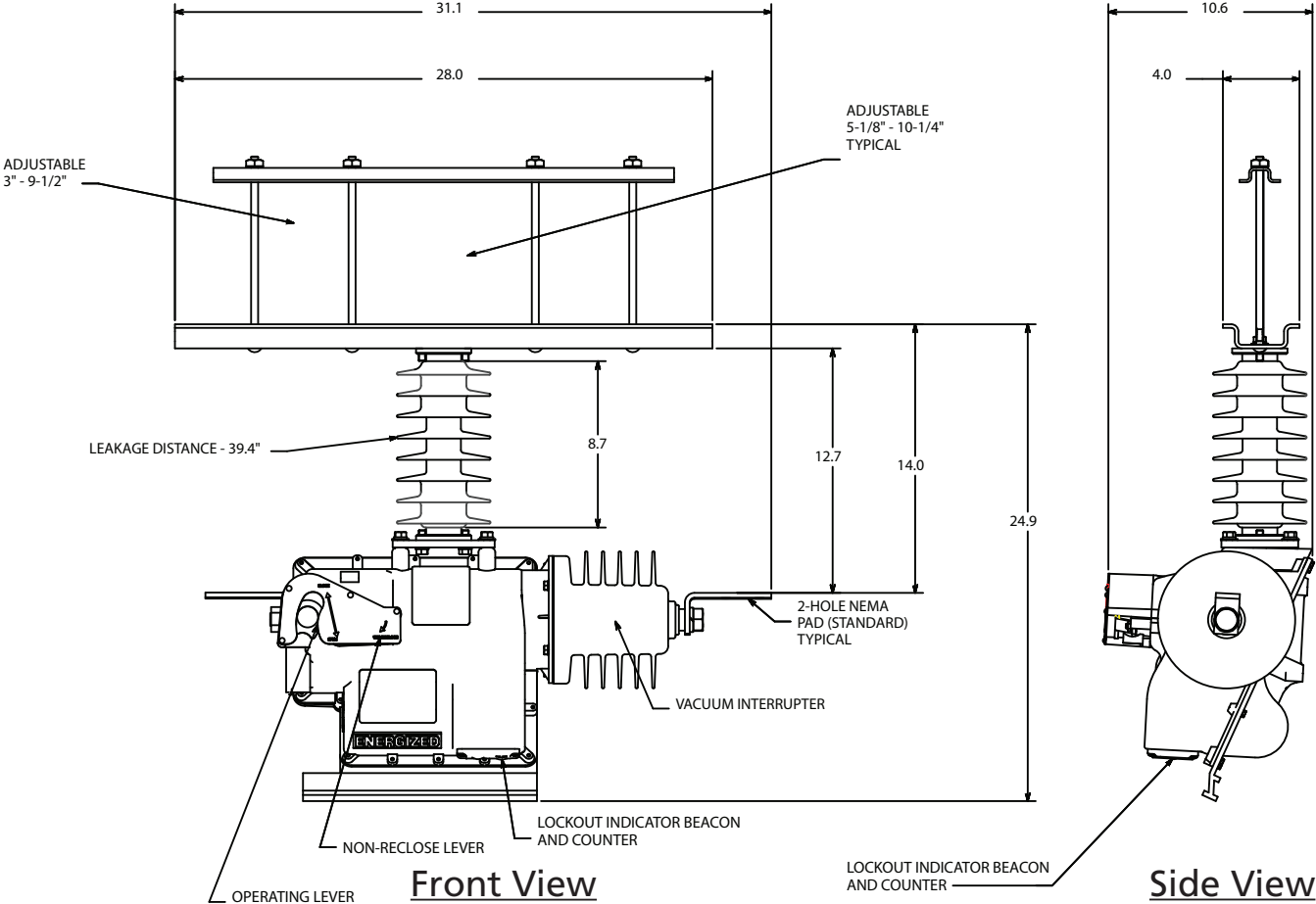


**Front View**



**Side View**

# Dimensions - Crossarm mounting



	1	2	3	4	5	6	7	8
TO BUILD YOUR VERSA-TECH® RECLOSER, ADD FEATURES FROM THE MATRIX	1	2	3	4	5	6	7	8
TO THIS BASE NUMBER: <b>CATALOG No. PSC86</b>	2	X	1	X	X	X	X	1
VOLTAGE RATING 27kV	2							
VERSA-TECH I	1							
VERSA-TECH II WITH WIFI	2							
VERSA-TECH II WITH SiFLEX RADIO	3							
MINIMUM FAULT TRIP 30A	1							
POLE/STRUCTURE MOUNT	1							
CROSSARM MOUNT	2							
POLE WITH GROUND CONNECTOR	3							
NO CONNECTORS	1							
PG (PARALLEL GROOVE) CLAMPS (2)	2							
CAPTIVE HARDWARE	3							
SINGLE TAP LUG	4							
DOUBLE TAP LUG	5							
NO RADIO	1							
STANDARD PERFORMANCE REMOTE DIGI RADIO *	2							
HIGH PERFORMANCE SiFLEX REMOTE RADIO *	3							
WIFI RADIO *	4							
XBEE RADIO *	5							
CELLULAR MODEM - GSM **	6							
CELLULAR MODEM - CDMA **	7							
POLE PLAQUES (ADDITIONAL)								
RESERVED								1

The number in Position 7 is the number of pole plaques in addition to the one included with each recloser (Ex: 3 is 3 more for a total of 4)

\* APPLICABLE TO VERSA-TECH I ONLY  
 \*\* APPLICABLE TO VERSA-TECH II ONLY

### Instruction Manual Included with each unit

Step-by-step instructions are included with each Versa-Tech® II Recloser. The detailed manual describes and illustrates all pertinent information from unpacking and installation procedures to software troubleshooting.



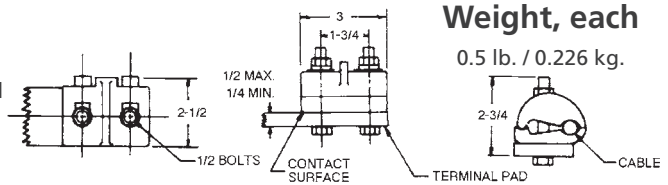
### Non-Reclose Hookstick Adapter Kit

Included with each unit  
 This adapter can be attached to the NR lever to allow for easier operation with a hookstick.



### Parallel Groove Clamp Accessory Ordering Information

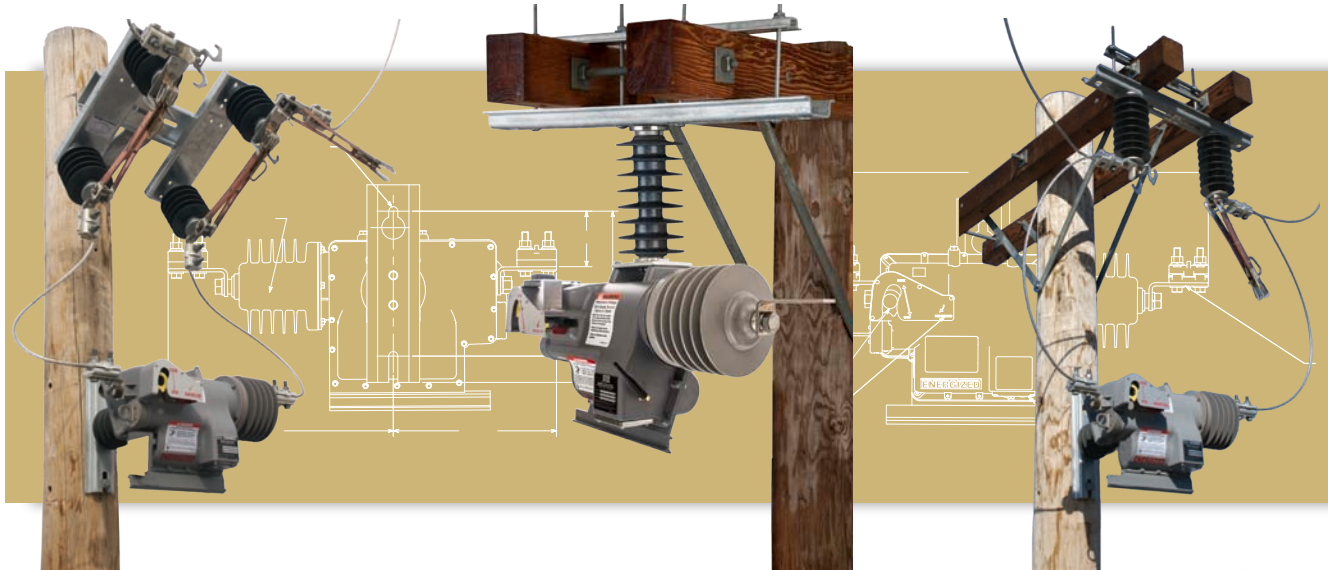
Available as a separate line item, Catalog No. ATC1343, fortified cadmium-plated aluminum parallel groove clamp, is furnished with galvanized steel bolts and nuts and will accept #2 through 500 kcmil aluminum or copper conductor.



### Replacement Items

Catalog No.	Description	Weight (lb./kg.)
PSC8620064	Replacement Battery	1.79 / 0.810
PSC8620253	Non-Reclose Hookstick Adapter Kit	0.085 / 0.038
PSC8620083	Custom USB to DB-15 Cable	0.183 / 0.083
PSC8620079	GSM Cellular Modem	0.597 / 0.271
PSC8620082	CDMA Cellular Modem	0.597 / 0.271
PSC8620069	Local High Performance SiFLEX Radio	1.25 / 0.57
PSC8620066	Pole Mount Hardware	5.4 / 2.45
PSC8620067	Underhung Hardware	12.5 / 5.67
PSC8620397	Battery Pack Replacement Kit	0.395 / 0.179

## Typical Applications

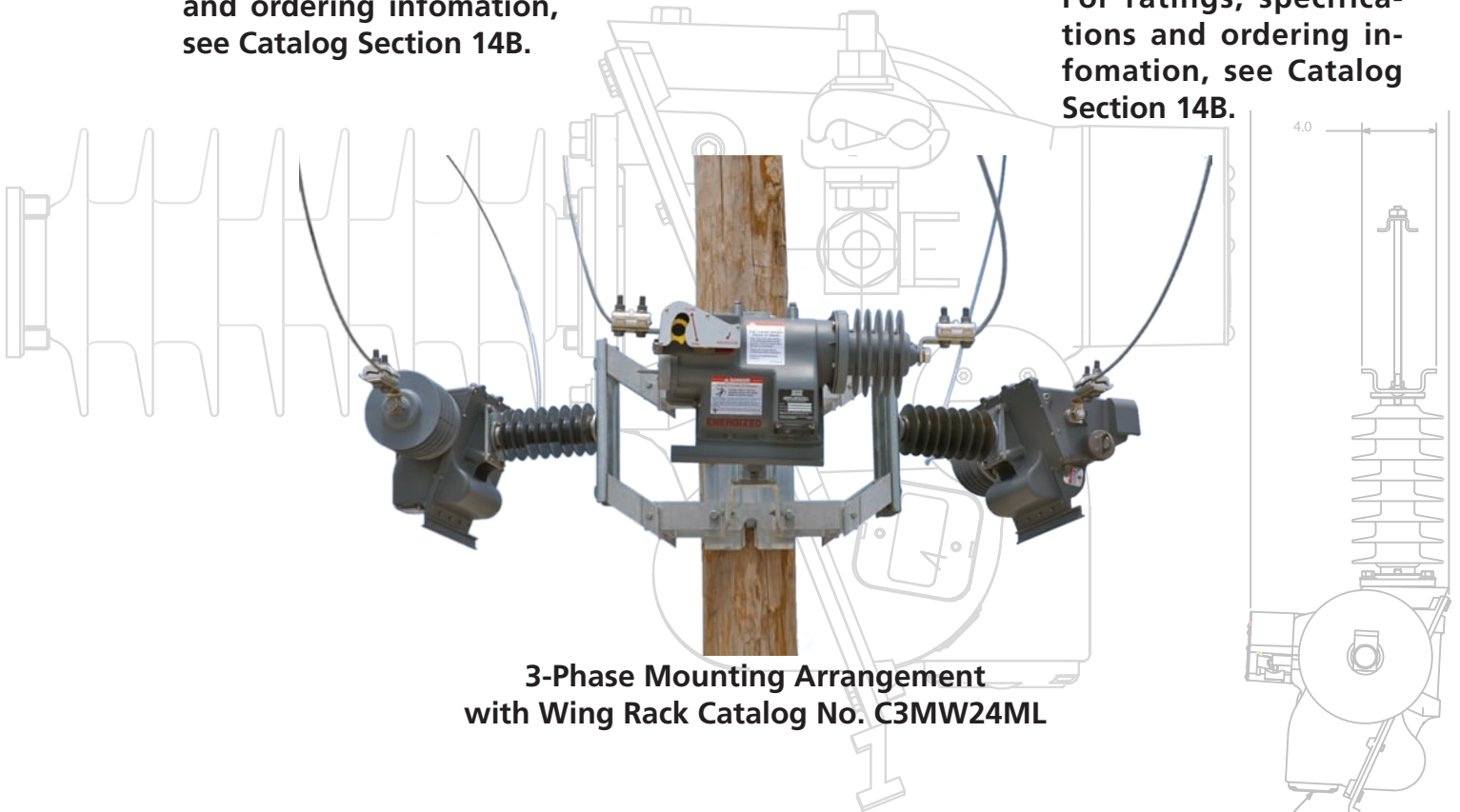


### 3-Pull Bypass Switch Arrangement

Type BP3 Switch shown. For ratings, specifications and ordering information, see Catalog Section 14B.

### Crossarm Mounting

Single Bypass Switch Arrangement  
Type M3 Distribution Class Switch shown. For ratings, specifications and ordering information, see Catalog Section 14B.



### 3-Phase Mounting Arrangement with Wing Rack Catalog No. C3MW24ML











# HUBBELL®

Power Systems

• 8100 Churchill Avenue • Leeds, Alabama 35094 • (205) 699-0840

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