Elastimold™ reclosers, switches and switchgear

elastimold™

Elastimold™ molded vacuum switches, interrupters and reclosers are designed to help increase reliability on distribution systems up to 38 kV. The dead-front, solid-dielectric switches and interrupters form the basis for modular, submersible, multi-way switchgear for padmount, vault and subsurface applications. Molded vacuum reclosers, available in single-phase, three-phase and triple-single, offer smart, light and flexible protection for overhead lines.

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Switchgear building blocks
Overview

Use Elastimold™ switchgear building blocks to create standard configurations and custom designs that improve your distribution system's reliability.

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01 Single-phase MVI

Two basic components form the basis of Elastimold switchgear:
- Molded vacuum switches (MVS) – Single- and three-phase
- Molded vacuum interrupters (MVI) – Single- and three-phase

These components – When combined with electronic controls, motor operators and SCADA-ready controls – enable you to improve your distribution system's reliability.

Whether yours is a standard or custom application, ABB has the right combination of components and expertise to fit your needs. The modularity and flexibility of Elastimold switchgear enable the user to combine the different individual components into products that improve the reliability and performance of distribution systems.

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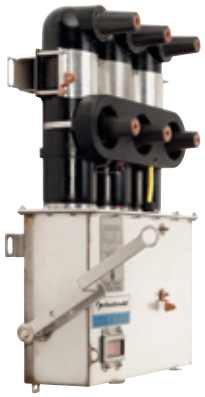
The benefits of Elastimold construction
- All switchgear components are fully sealed and submersible
- EPDM molded rubber construction with stainless steel hardware and mechanism boxes
- With no oil or gas to leak, the solid dielectric switchgear is maintenance free
- Deadfront construction insulates, shields and eliminates exposed live parts
- Optional Tru-Break™ switchgear module provides visual confirmation of the isolating gap in the switchgear conducting path for added safety and peace of mind

The versatility to meet your needs
- Small footprint enables components to fit in tight padmount, subsurface, vault or riser pole installations
- Non-position sensitive – can be installed almost anywhere and in any position (e.g. hanging from ceilings, wall mounted, mounted at an angle, riser pole mounted)
- Modular construction allows for any combination of fused, switched and interrupter ways on one piece of switchgear up to 38 kV

The controls and motor operators to make it all work
- Electronic controls for protection and automatic source transfer applications
- Self-powered controls and customized protection curves enable flexibility of settings and operation in different locations throughout the distribution system
- Motor operators for remote or local open/close operation of three-phase switched or interrupter ways enable remote configuration of loops, sectionalizing of feeders and automatic or manual source transfer with a variety of RTUs and communication devices



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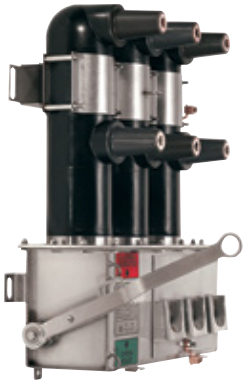

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01 Three-phase MVI
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02 Single-phase MVS
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03 Three-phase MVS
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04 Padmount
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05 Riser pole
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06 Subsurface
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07 Small vault

Configure Elastimold™ switchgear building blocks to solve challenges in your distribution system.

Elastimold switchgear products can be used in padmount, subsurface wet or dry vaults, small-vault and riser pole installations. They're classified in three different categories according to the function they perform:

- Switching and sectionalizing equipment
- Automatic source transfer equipment
- Overcurrent protection equipment

The switching or manual sectionalizing of loads can be accomplished with the use of MVS modules, while overcurrent protection is accomplished using MVI modules, which can be used in conjunction with MVS modules. The simplest manual sectionalizer is a single MVS switch, and the simplest product for overcurrent protection is a single MVI unit. Either of these can be installed in a vault, on a pole or inside a padmount enclosure.

One of the most popular applications is as a replacement for existing oil fuse cutouts.

Two-, three-, four-, five- and six-way units with any combination of MVI and MVS modules are also available in subsurface and padmount styles. Switches aid in the manual reconfiguration of distribution loops by installing them at the open point in the circuit. Interrupters are applied in underground loops to aid in the sectionalizing of the main feeder, and by providing protection to the loads along the loop.

Please see pages 25–32 for more information on switchgear applications.

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Molded vacuum switches and interrupters
MVS molded vacuum switches

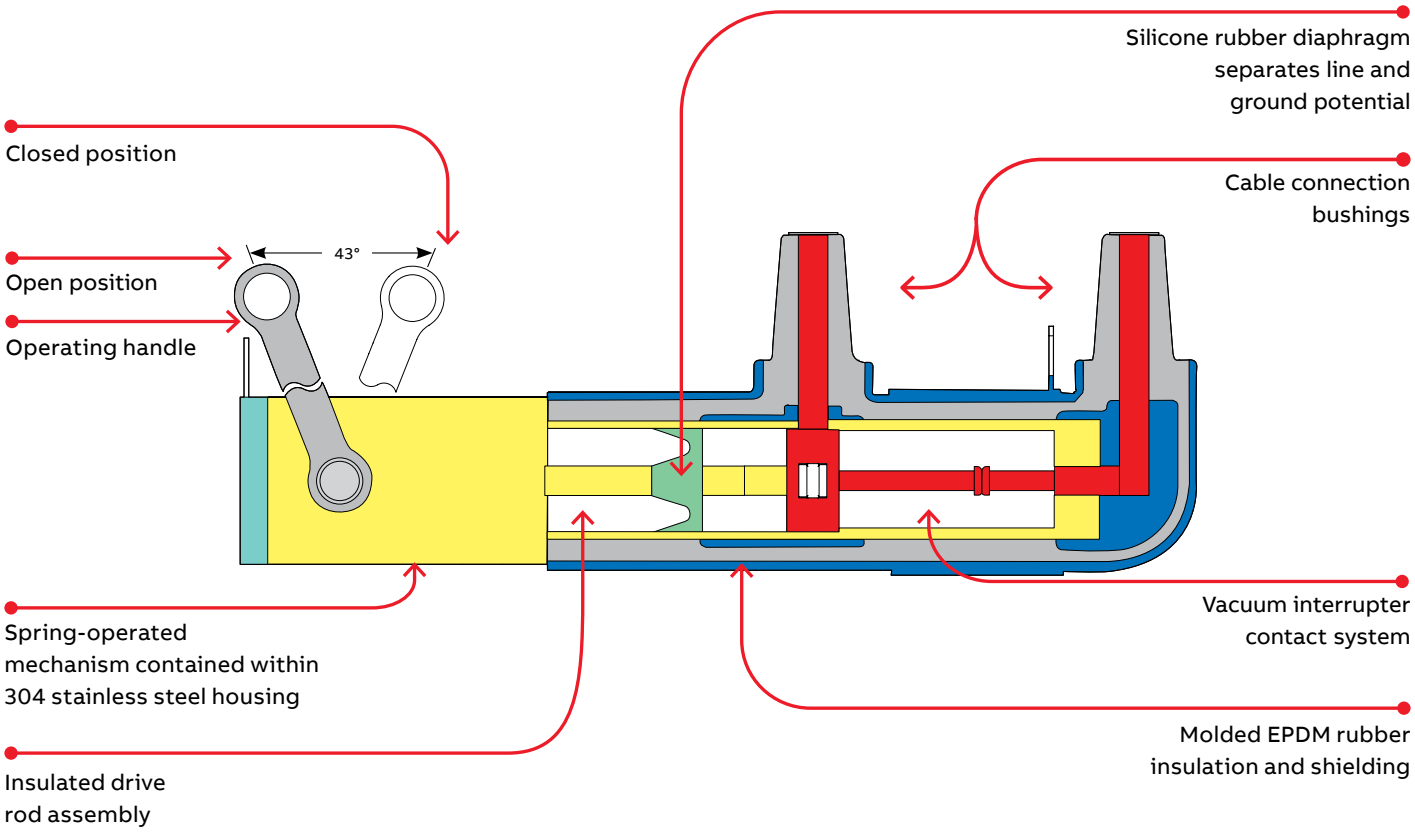
Spring-energy, load-switching devices that make, carry and interrupt load currents through 600 A on 5–38 kV distribution systems.

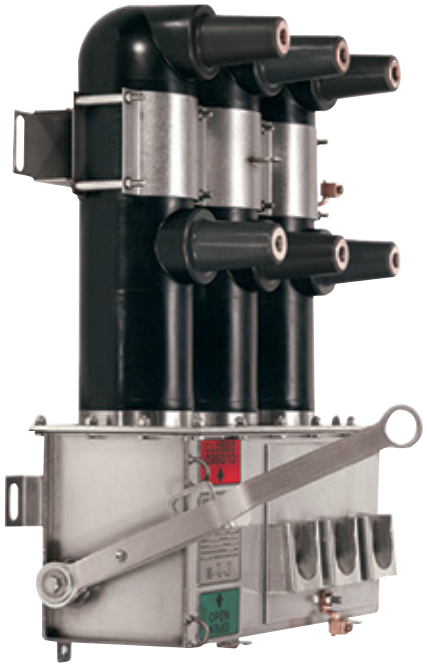
- EPDM molded rubber insulation – MVSs are fully sealed and submersible
- With no gas or oil leak, vacuum switching and vacuum interruption components are maintenance-free
- Small footprint enables MVSs to fit in tight padmount, subsurface, vault or riser-pole installations

MVS molded vacuum switches include molded-in elbow connection interfaces and spring-energy mechanisms. Available in both single- and three-phase models, units are manually operated with a hotstick. Motor operator, SCADA and auto-transfer control options are available.

Application information
- Construction: submersible, corrosion resistant, fully shielded
- Operating temperature range: -40 °C to 65 °C

For dimensions, see page 30.





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Certified tests

MVS load-break switches have been designed and tested per applicable portions of IEEE, ANSI, NEMA and other industry standards, including:	
IEEE C37.74	Standard for subsurface, vault and padmounted load-interrupting switches
IEEE 386	Standard for separable connectors and bushing interfaces
IEC 265	International standards for load-interrupting switches
ANSI C57.12.28	Standard for padmount enclosures

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MVS ratings

Voltage class (kV)	15	15	15	27	27	27	35
Maximum design voltage (kV)	17	17	15.5	29	29	29	38
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
BIL impulse (kV)	95	95	95	125	125	125	150
One-minute AC withstand (kV)	35	35	35	60	60	60	70
Five-minute DC withstand (kV)	53	53	53	78	78	78	103
Load interrupting and loop switching (Amp)	630	630	630	630	630	630	630
Capacitor or cable charging interrupting (Amp)	10	10	10	15	15	15	20
Asymmetrical momentary and 3-operation fault close (Amp)*	20,000	25,600	32,000	20,000	25,600	64,000	20,000
Symmetrical one-second rating (Amp)	12,500	16,000	20,000	12,500	16,000	40,000	12,500
Continuous current (Amp)	630	630	630	630	630	630	630
Eight-hour overload current (Amp)	900	900	900	900	900	900	900
Current sensor ratio	1,000:1	1,000:1	1,000:1	1,000:1	1,000:1	1,000:1	1,000:1
Mechanism	Spring operating	Spring operating	Spring operating	Spring operating	Spring operating	Mag actuator	Spring operating

*800amps configurations available

Molded vacuum switches and interrupters
MVI molded vacuum fault interrupters

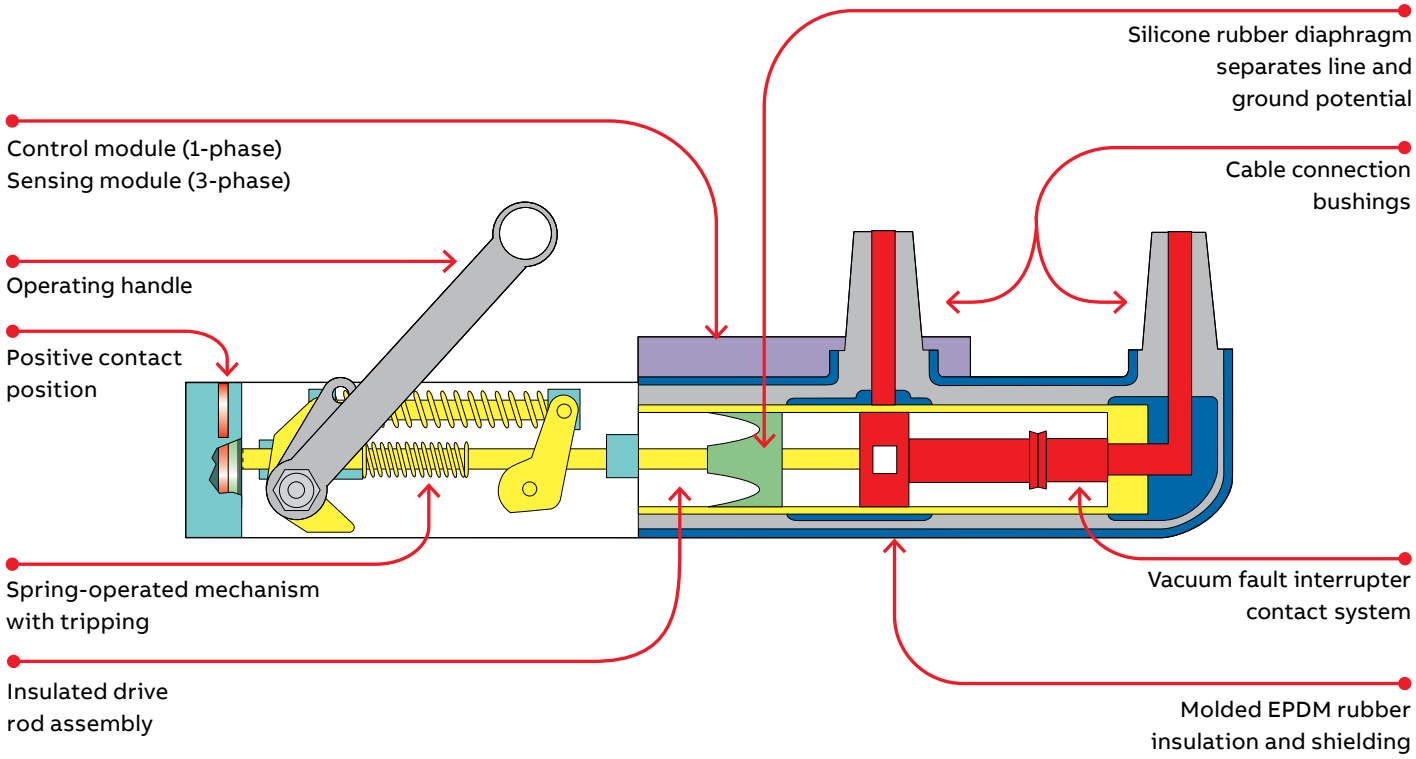
Make, carry and automatically interrupt currents through 25,000 A symmetrical on 5–38 kV distribution systems.

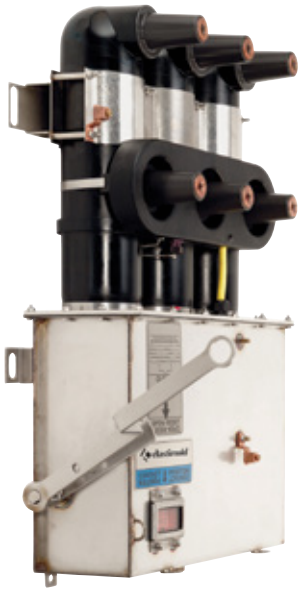
- Vacuum interrupters, programmable, electronic, self-powered controls and EPDM rubber insulation provide compact, lightweight and submersible overcurrent protection
- Field programmable with a wide range of time-current characteristic (TCC) curves and trip settings
- TCC curves provide predictable tripping for ease of coordination with upstream and/or downstream protective devices
- Control monitors the circuit condition – when the programmed parameters are exceeded, a signal is sent to the tripping mechanism
- Available motor operators and controls enable radial feeders or loops to be reconfigured, either manually or via SCADA

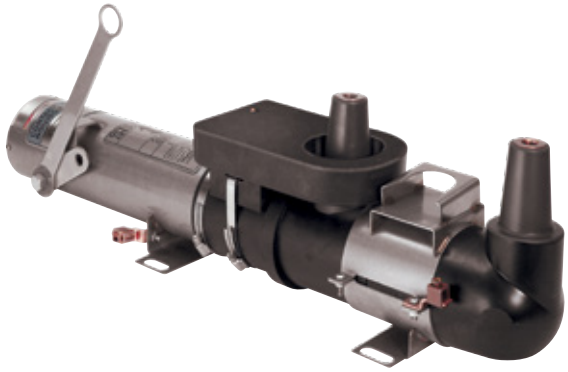
MVI molded vacuum fault Interrupters include molded-in elbow connection interfaces and trip-free mechanisms. They are available in single- and three-phase models.

Application information
Construction: submersible, corrosion resistant, fully shielded
Operating temperature range: -40 °C to 65 °C

For dimensions, see page 31.







Certified tests

MVI molded vacuum fault interrupters have been designed and tested per applicable portions of IEEE, ANSI, NEMA and other industry standards, including:	
ANSI C37.60	Standard for fault interrupters
IEEE 386	Standard for separable connectors and bushing interfaces
ANSI C57.12.28	Standard for padmounted enclosures

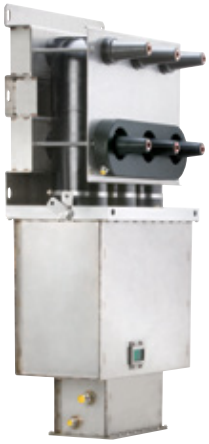
MVI ratings

Voltage class (kV)	15	15	15	27	35	35
Maximum design voltage (kV)	17	17	15.5	29	38	38
Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
BIL impulse (kV)	95	95	95	125	150	150
One-minute AC withstand (kV)	35	35	35	40	50	50
15-minute DC withstand (kV)	53	53	53	78	103	103
Load interrupting and loop switching (Amp)	630	630	630	630	630	630
Capacitor or cable charging interrupting (Amp)	10	10	10	25	40	40
Line charging (Amp)	2	2	2	5	5	5
Asymmetrical momentary and 3-operation fault close (Amp)	20,000	25,600	32,000	20,000	20,000	40,000
Symmetrical one-second rating (Amp)	12,500	16,000	20,000	12,500	12,500	25,000
Continuous current (Amp)*	630	630	630	630	630	630
Eight-hour overload current (Amp)	900	900	900	900	900	900
Current sensor ratio	1,000:1	1,000:1	1,000:1	1,000:1	1,000:1	1,000:1
Mechanism	Spring operating	Spring operating	Spring operating	Spring operating	Spring operating	Mag actuator

*800 Amps configurations available

Higher fault-current rated switches and interrupters

Three-phase 38 kV/25 kA MVI and three-phase 27 kV/40 kA MVS



01 38 kV/25 kA MVI

02 27 kV/40 kA MVS

If you require higher fault-current ratings than the typical 12.5 kA specification, Elastimold™ switchgear is available with ratings of 16 kA, 20 kA, 25 kA and even 40 kA. Please refer to the table below for ratings of specific models.

Three-phase 38 kV/25 kA MVI
The three-phase 38 kV/25 kA molded vacuum interrupter (MVI) incorporates the proven combination of the Elastimold EPDM molded insulation with a vacuum interrupter. This solid-dielectric unit features a 25 kA symmetrical fault interrupting vacuum bottle and a magnetic actuator mechanism.

This MVI works with the Elastimold 80 MAX control. The small, lightweight, maintenance-free unit is ideal for padmount, subsurface and vault applications.

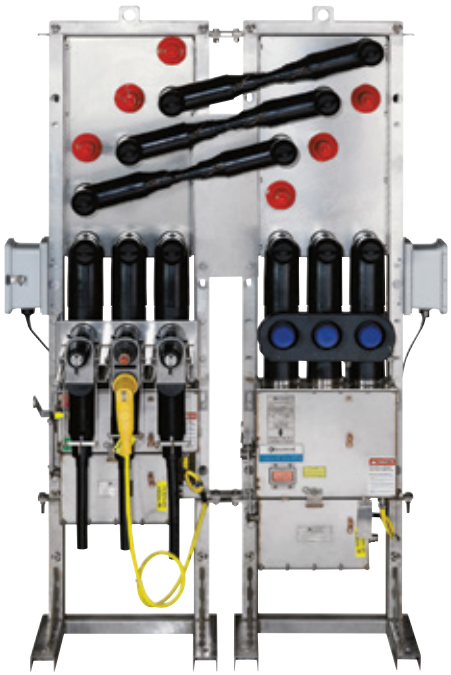
Three-phase 27 kV/40 kA MVS
The three-phase 27 kV/40 kA molded vacuum switch (MVS) incorporates the proven combination of the Elastimold EPDM molded insulation with a load-break switch vacuum bottle. This solid-dielectric unit is small, lightweight and maintenance-free. It meets IEEE C37.74 requirements up to 40 kA symmetrical peak and short-time current withstand tests. The switch uses a magnetic actuator mechanism that requires 120 V AC to operate.

For dimensions, see page 35.

Elastimold switchgear available current ratings

	12.5 kA	16 kA	20 kA	25 kA	40 kA
MVS – three-phase (kV)					
15	●	●	●	–	–
27	●	●	–	–	●
38	●	–	–	–	–
MVI – three-phase (kV)					
15	●	●	●	–	–
27	●	–	–	–	–
38	●	–	–	●	–

Modular switchgear for subsurface and vault applications

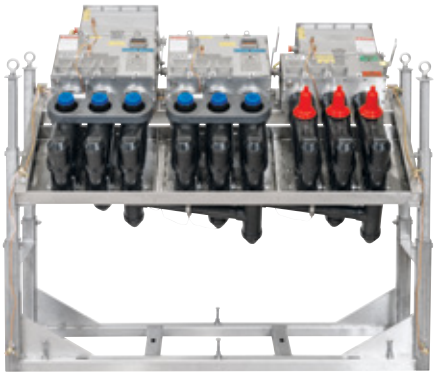


Multi-way subsurface units are built using MVS and MVI modules rated up to 38 kV, as required by your application. These are mounted onto a common molded bus system and assembled on a free-standing, floor-mounted or wall-mounted frame.

The compact, modular design, which fits easily through a manhole cover, allows for combining with other devices. Components are interchangeable, upgradeable and field configurable, and they can be installed in any orientation.
For dimensions, see page 13.

Small-vault switchgear

Elastimold™ small-vault switchgear improves safety with manual operation outside the vault



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01 Small-vault switchgear
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02 Standard modular switchgear

ABB has extended its line of underground distribution switchgear with Elastimold small-vault switchgear, which improves safety by allowing the user to access the switchgear from outside the vault with an insulated fiberglass pole (hot stick). In addition to safety, low maintenance and reliability, Elastimold small-vault switchgear fits into new and legacy small-vaults, which minimizes retrofitting costs for investor-owned utilities (IOUs), public power utilities and other power distribution operations.

Safe

Allows for manual operation from street level.

- Improved operator safety, visibility and accessibility
- Switchgear designs allows for hot stick operation from street level
- 45° tilt angle improves operator safety through full operability and visibility from street level

Compact

33% reduction in height and 14% reduction in width from standard switchgear.

- 6" adjustable vertical frame allows for customization to each vault
- Reduced height and width allows users to install in compact vaults

Reliable

Maintenance-free vacuum and EPDM molded insulation.

- Proven solid dielectric construction
- Technology with over 50 years of field-proven performance
- Fewer outages and significantly shorter outage duration
- All switchgear components are sealed and fully submersible

		Ways					
Gear	**Dimensions**	**2**	**3**	**4**	**5**	**6**	**Notes**
Small vault	Height (in.)	51.62	51.62	51.62	51.62	51.62	Height depends on gear selected and application. Up to 33% reduction Max. height 60.375"
	Width (in.)	50.50	69.35	90.00	110.00	128.75	Up to 14% reduction
	Depth (in.)	27.50	27.50	27.50	27.50	27.50	Depth depends on gear selected. Max. depth 41.75"
Standard modular	Height (in.)	76.45	76.45	76.45	76.45	76.45	
	Width (in.)	48.79	73.83	98.89	122.91	148.98	
	Depth (in.)	20.00	20.00	20.00	20.00	20.00	

Padmount switchgear

— 01 Single-sided padmount unit
— 02 Double-sided padmount unit (load side)

Multi-way padmount installations are provided in either double-sided or single-sided painted mild steel enclosures.

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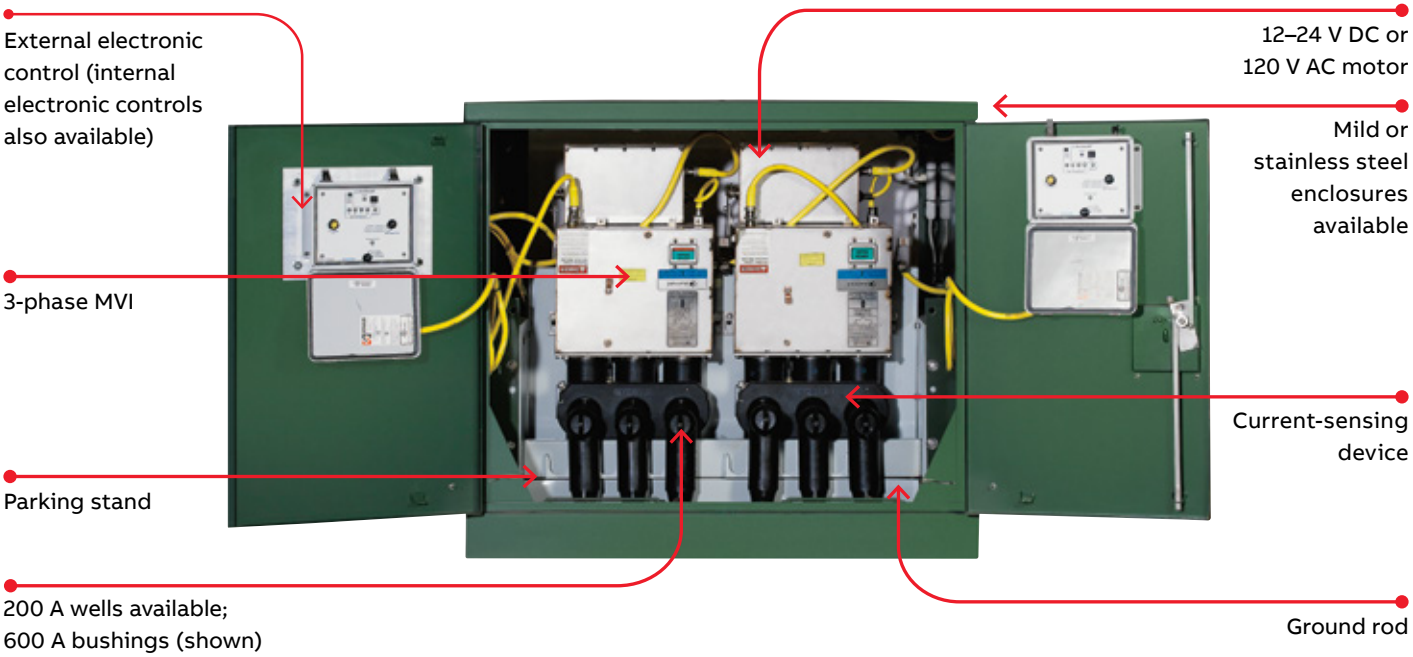
The standard enclosure color is Munsell green 7GY 3.29/1.5, with other paint colors available on request. Painted stainless steel or fiberglass enclosures are also available as options.

For dimensions, see page 33.



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Molded vacuum interrupter and switchgear controls

Choose among various electronic control options to interrupt faults.

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01 Internal control
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02 External control

- Self-powered electronic control packages – No batteries or external power are required
- Controls send a signal to the vacuum interrupters to trip open and interrupt the fault when an overcurrent condition is detected
- Field-selectable fuse or relay curves and trip settings – one device for many protection schemes

Molded vacuum interrupters are provided with self-powered electronic control packages requiring no batteries or external power. Depending on the application, six electronic control options are available for the MVI – See below and on following page.

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Internal control
This control is integral to the unit (no separate control box). It is accessible via a computer connection to view or modify settings. This control is used on ganged three-phase or single-phase MVI interrupters. Phase and ground trip, as well as inrush restraint, are available. The E-Set software enables the user to connect to the internal control, either in the shop or in the field, to program or change settings. An MVI-STP-USB programming connector is required to connect between the PC and the MVI. With a computer connected to the MVI control, the user can view real-time currents, the number of overcurrent protection operations, current magnitude of the last trip and the phase/ground fault targets. This is the standard control option.
Note: E-Set can be downloaded from **www.elastimoldswitchgear.com**.

External control with selectable single-/three-phase trip function (style 80)
This control is mounted externally to the mechanism of the interrupter and provides the ability to select between a single-phase trip and a three-phase trip. The 80 can be used with one three-phase interrupter or the 380 control with three single-phase interrupters. For three-phase applications, the ground trip function can be blocked from the front panel. Manual trip and reset target buttons are also located on the front panel. This control uses the E-Set software, which enables programming via a computer using the MVI-STP-USB adapter. E-Set features custom TCC curves and provides access to the last fault event information, as well as real-time current per phase.

Molded vacuum interrupter and switchgear controls

01 SEL-751A
Feeder protection

02 SEL-451
Automation and auto-transfer controls (standard and fast transfer options)

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Smart grid ready
Works with the industry-leading protection and automation controls

- SEL* automation controls from Schweitzer Engineering Laboratories

Elastimold 80 control time current curves (TCCs)

Curve no.	Curve reference no.	Curve type
Relay curves (minimum trip 30–600 A)		
01	MVI-TCC-01	E slow
02	MVI-TCC-02	E standard
03	MVI-TCC-03	Oil fuse cutout
04	MVI-TCC-04	K
05	MVI-TCC-05	Kearney QA
06	MVI-TCC-06	Cooper EF
07	MVI-TCC-07	Cooper NX-C
08	MVI-TCC-08	CO-11-1
09	MVI-TCC-09	CO-11-2
10	MVI-TCC-10	T
11	MVI-TCC-11	CO-9-1
12	MVI-TCC-12	CO-9-2
13	MVI-TCC-13	Cooper 280ARX
14	MVI-TCC-14	F
16	MVI-TCC-16	Kearney KS
17	MVI-TCC-17	GE relay
18–23	MVI-TCC-18–23	CO-8-1–CO-8-6
24–27	MVI-TCC-24–27	CO-9-3–CO-9-6
28–31	MVI-TCC-28–31	CO-11-3–CO-11-6
Fuse curves (minimum trip 10–200 A)		
54	MVI-TCC-54	E slow
55	MVI-TCC-55	E standard
56	MVI-TCC-56	Oil fuse cutout
57	MVI-TCC-57	K
58	MVI-TCC-58	Kearney QA
59	MVI-TCC-59	Cooper NX-C
60	MVI-TCC-60	T

* SEL is a trademark of Schweitzer Engineering Laboratories Inc.

Tru-Break™ switchgear module

Because there's no room for doubt when it comes to safety.

No one should have to guess whether it's safe to do their job. With the Tru-Break switchgear module, the answer is always clear.

Elastimold solid-dielectric molded vacuum switches, interrupters and switchgear are now available with the Tru-Break switchgear module that makes it easy for linemen to switch the handle to the open position and visually verify the isolating gap in the conducting path. With the certainty that the circuit is open, they can begin their internal process and steps to safely ground the line and perform maintenance on the de-energized, isolated and grounded circuit.

- Rated for 15–29.3 kV, 630 A, 20 kA systems
- IEEE 386 600-amp interface bolted connection
- Dead-front construction and hot-stick operable
- Clear viewing windows for easy visual verification of contact status
- Compact, modular and mechanically interlocked with connected switch or interrupter
- Capable of withstanding full 125 kV basic insulation level (BIL) impulse voltage without needing the vacuum bottle connected in series for voltage withstand support
- Submersible and storm-hardened — designed for use in harsh vault and pad-mount environments
- Retrofittable options available for existing Elastimold three-phase and single-phase MVS switches or MVI interrupters and one- to six-way switchgear
- Tested to the IEEE C37.74-2014 standard

Seeing is believing.

Designed to provide an added level of safety for linemen, the Tru-Break switchgear module is an innovative, hotstick-operable modular unit that mechanically interlocks with the connected switch or interrupter, so that the Tru-Break switchgear module's handle cannot be operated if the switch or interrupter is in the closed position and the vacuum bottle is conducting current.

The modular design offers the important advantage of enabling economical retrofit of the Tru-Break switchgear module to both single-phase and three-phase Elastimold switchgears already installed in the field.

For time-saving convenience and added safety, the 1.75-inch glass-covered viewing windows have hotstick-removable caps to keep them clean for clear, easy viewing of contact status — even in wet, dirty vault applications.

Open position

Closed position

Tru-Break switchgear module

Safe.
- Dead-front construction with clear visual verification of circuit isolation
- Positive-latching handle ensures that unit is in fully open or fully closed position
- EPDM rubber eliminates the need for venting ports required with rigid epoxy constructions
- Capable of withstanding full 125 kV BIL impulse voltage without the need for vacuum bottle series-connected support
- ANSI/IEEE standard 600-amp bolted connection points can be ordered with standard Elastimold cable accessory grounding devices to incorporate easy, built-in grounding capability

Reliable.
- Uses a proprietary EPDM rubber formulation — field proven for over 50 years — on a solid-dielectric platform
- Uses silicone diaphragm and air as an insulating medium
- Maintenance-free operation — no oil or gas*
- Rated and tested for optimum performance, even in the harshest environments

Flexible.
- Rated for use with 15–29.3 kV, 630 A, 20 kA systems
- Rugged and submersible for multiway pad-mount or vault applications
- Compact size minimizes impact to switchgear footprint
- Modular design allows the potential for economical retrofit of existing single-phase and three-phase Elastimold switchgear

* The Elastimold Tru-Break switchgear module is considered maintenance-free because it contains no oil or gas to monitor or maintain.

Tru-Break switchgear module

Tru-Break switchgear module ratings

Maximum system voltage	17.1 kV and 29.3 kV
Continuous load current	800 A
Short circuit withstand current	20 kA
Power frequency withstand voltage	60 kV AC
Lighting impulse withstand voltage (BIL)	125 kV

Note: Ratings and testing per IEEE/ANSI 37.74.

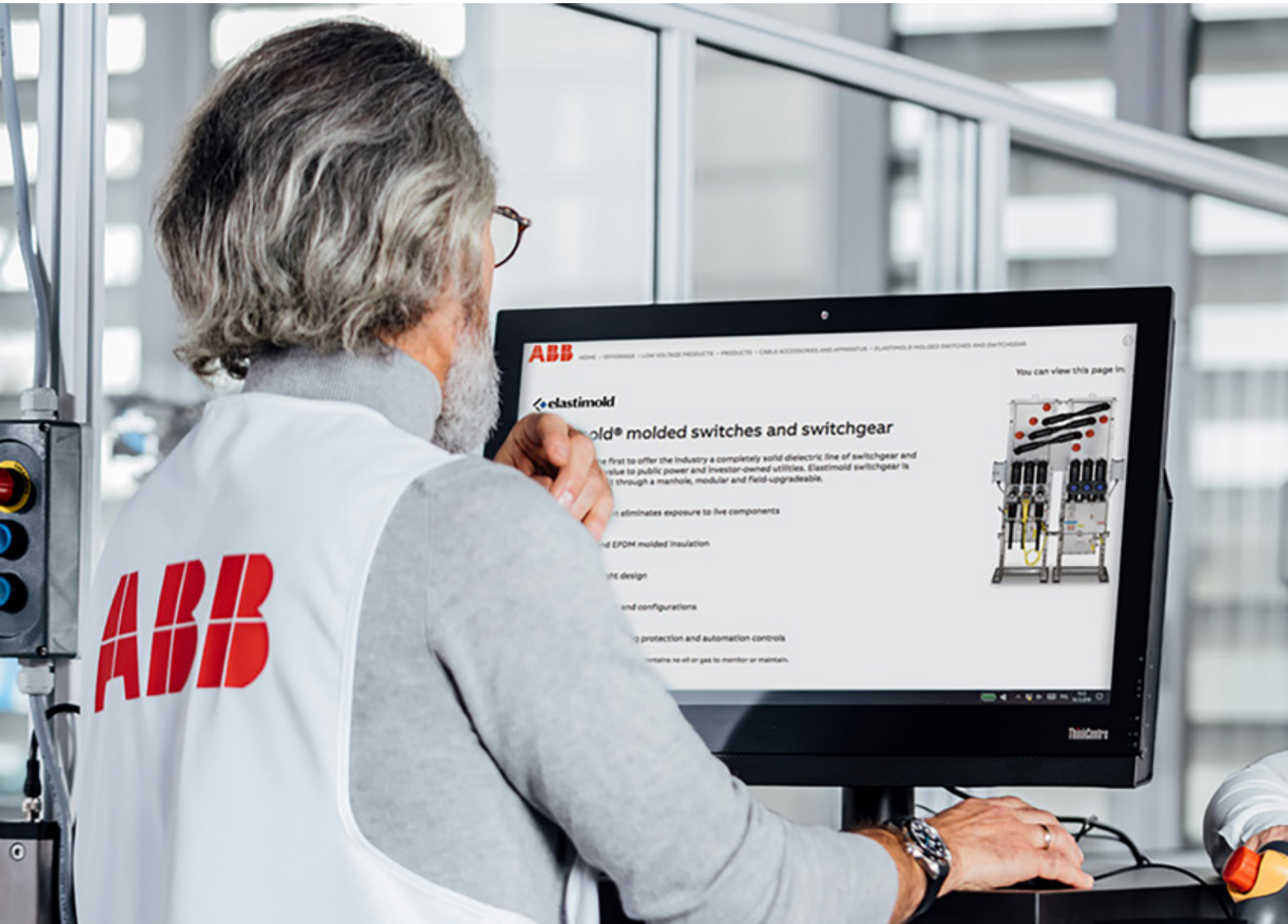
Elastimold standard three-phase and single-phase switch and interrupter product ratings that can be supplied with the Tru-Break option

	12.5 kA	16 kA	20 kA
1-phase or 3-phase MVS molded vacuum switch			
15 kV	•	•	•
27 kV	•	•	
1-phase or 3-phase MVI molded vacuum interrupter			
15 kV	•	•	•
27 kV	•		

Ordering information

Elastimold™ switchgear configurator and smart catalog numbering system make ordering easier.

- Simplifies and speeds up the configuration of complex switchgear
- Walks you step by step through your options
- Allows for both standard and derivative configurations



Ordering information

Switchgear configurator

ABB launched a switchgear configurator for modular designs to better service customers, while maintaining desired flexibility and cost effectiveness. The modular designs are classified into two categories: standard and derivative. Standard types use only the available options listed in the switchgear configurator. Derivative types have minor deviations from the standard design, including but not limited to cabinet color, cabinet size, reverse color indicators and 120 V AC motors.

The standard and derivative configurations are committed to supplying faster turnaround times for drawings and quotations. In addition, the modular design allows for simple and fast switchgear changes, expansions and upgrades. The configurator has built-in logic to easily configure switchgear options and provide simpler interactions between the customer and the factory. Any options not outlined in this document, including but not limited to nonstandard cabinet sizes, radios, antennas, custom relays and non-standard wiring, will designate the configuration as custom and will have to be approved by ABB before quotation and order.

Get started now. Visit:
https://productconfigurator.tnb.com/ext/Login

https://empower.abb.com/empower/configurators

Switchgear configurator

	Configurator
Benefits summary	**Options standard or derivative**
Turnaround time for configuration	10 minutes (approximately)
Turnaround time for drawings	2–3 weeks (one time)
Turnaround time for budgetary pricing	Standard types: after completion of configuration
	Derivative types: 48 hours or less
Turnaround time for estimated delivery time	48 hours
	Option A (first time) = 2–3 weeks plus TOPS LT
Lead time for delivery of final product	8–12 weeks target after engineering
Price	Cost efficiencies enabling more aggressive pricing
	Firm fixed pricing
Change in design requests	No charge 2 weeks prior to manufacturing (may impact delivery)
Quantities	No minimum quantities

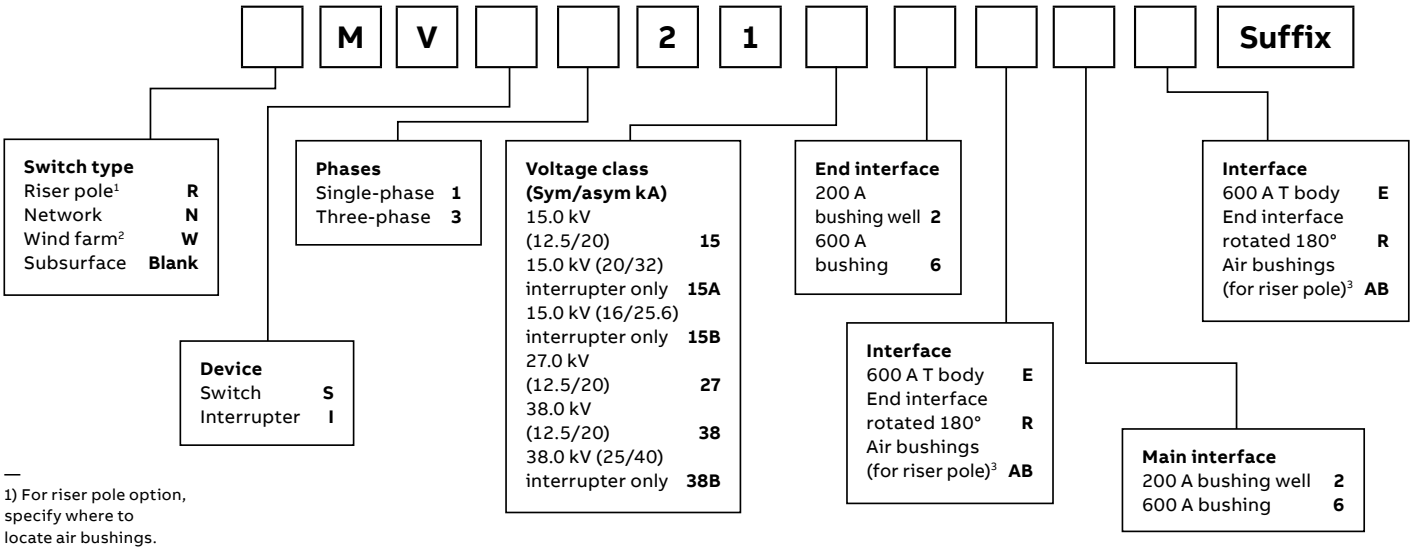
Ordering information

Elastimold™ MVS and MVI units

The following diagram shows how to construct a catalog number for molded vacuum switches and interrupters.

Example: The catalog number for a molded vacuum interrupter on a three-phase, 27 kV system, with 600 A terminal and parking stands between bushings is MVI3212766PS.

☐ Indicates field that must be filled in to complete order.



1) For riser pole option, specify where to locate air bushings.
2) Wind farm option is only for 38 kV, 600 A interrupter.
3) Air bushings can only be specified for 600 A.

Controls and accessories

Suffix	Description
80	External 80 control with selectable single-/three-phase trip function (to be used on ganged three-phase MVI mechanism)
380	External 80 control with selectable single-/three-phase trip function (to be used on three single-phase mechanisms)
EC	External control ready (10-pin connection)
MO120A	120 V AC motor controller for MVS3 or MVI3 units (includes standard 30-ft. cable)
MO12D	12–24 V DC motor controller for MVS3 or MVI3 units (includes standard 30-ft. cable)
PS	Parking stand for MVS or MVI (between bushings for single- or three-phase units)
MPS	Parking stand for MVS3, MVI3 or RMVI3 on mechanism cover
PS6	Double parking stand for MVS3, MVI3 or RMVI3 (between bushings and on mechanism cover)
T	Manual Tru-Break (manual MVI3/MVS3 only)
TA*	Manual Tru-Break, compatible with 120VAC motor
TD*	Manual Tru-Break, compatible with 12/24VDC motor
BT	Bail tab plate installed for three-phase units only
P	Customer settings to be programmed at the factory
R	Position indicator labels (none: standard, R: reverse)
S	Language (none: English, S: Spanish)

*Note: Only available in three phase Tru-Break systems

Ordering information

Elastimold™ multi-way switchgear and transfer packages

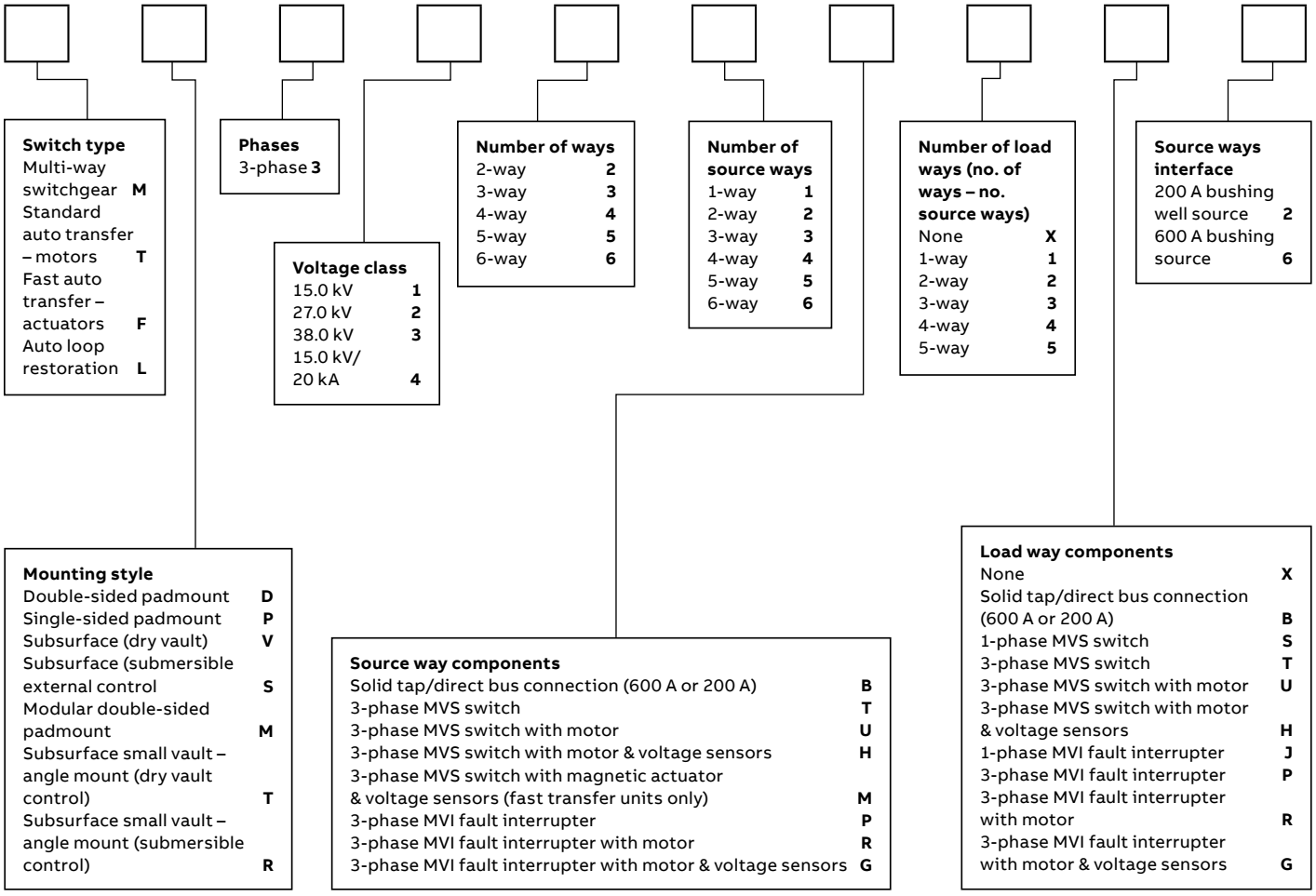
The following diagram shows how to construct a catalog number for multi-way switchgear or transfer packages.

Example: Multi-way switchgear **MD3142T2P62XIXXAE000**: Multi-way, double-sided padmount, 3-phase, 15.0 kV, 95 kV BIL,12.5 kA interrupting capability, 4-ways, 2 source ways, source component: three-phase molded vacuum switches (MVS3), 2 load ways, load component: three-phase molded vacuum interrupter (MVI3), 600 A bushing interfaces (source), 200 A bushing well interfaces (load), source control: none, load control: Elastimold MVI internal control, PT: PT not required, enclosure: mild steel, Munsell green 7GY 3.29/1.5 and flat ground bar, English labels and instructions.

Example: Auto transfer switchgear with SEL* control package **TD3242H2P62GHFXAE000**: Automatic transfer, double-sided padmount, 3-phase, 27.0 kV, 125 kV BIL,12.5 kA interrupting capability, 4-ways, 2 source ways, source component: three-phase molded vacuum switches (MVS3) with 12–24 V DC motor and voltage sensors, 2 load ways, load component: three-phase molded vacuum interrupter (MVI3), 600 A bushing interfaces (source), 200 A bushing well interfaces (load), source control: sel 451-5 relay, load control: SEL 751A relay, PT: two (2) 27 kV PT (13200–14400 V AC (WYE), enclosure: mild steel, Munsell green 7GY 3.29/1.5 and flat ground bar, English labels and instructions.

* SEL is a trademark of Schweitzer Engineering Laboratories, Inc.

☐ Indicates field that must be filled in to complete order.



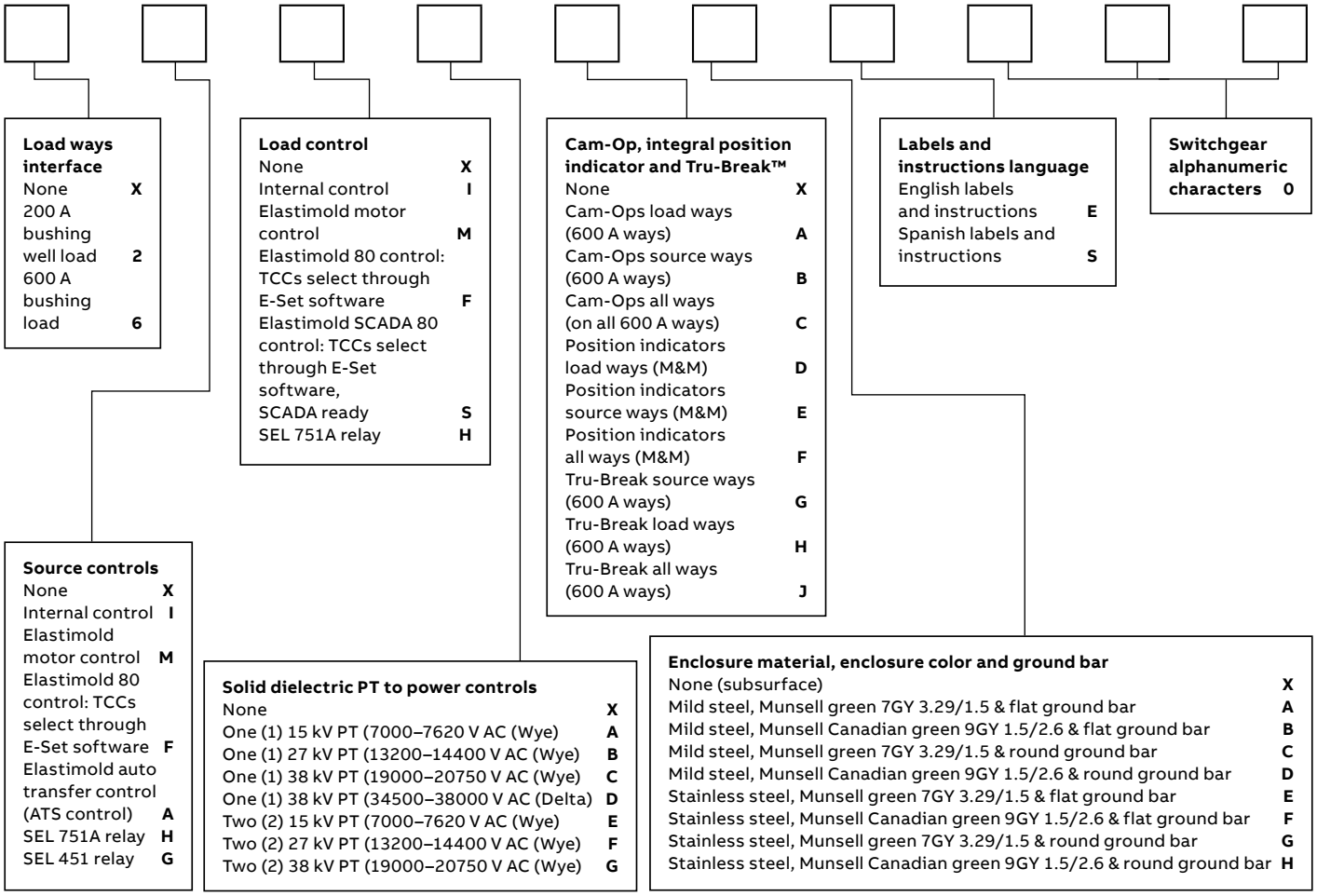
Ordering information

Elastimold™ multi-way switchgear and transfer packages

Example: Auto transfer switchgear with Elastimold control package
TD3242H2P62AFFXAE000: Automatic transfer, double-sided padmount, 3-phase, 27.0 kV, 125 kV BIL,12.5 kA interrupting capability, 4-ways, 2 source ways, source component: three-phase molded vacuum switches (MVS3) with 12–24 V DC motor and voltage sensors, 2 load ways, load component: three-phase molded vacuum interrupter (MVI3), 600 A bushing interfaces (source), 200 A bushing well interfaces (load), source control: Elastimold automatic transfer control, load control: Elastimold 80 control: TCCs select through E-set software, PT: two (2) 27 kV PT (13200–14400 V AC (WYE), enclosure: mild steel, Munsell green 7GY 3.29/1.5 and flat ground bar, English labels and instructions.

Online switchgear configurator
The ABB online switchgear configurator makes it easy to order Elastimold switchgear by walking you step by step through configuration. See pages 17–18 for details.

☐ Indicates field that must be filled in to complete order.



Load ways interface	
None	X
200 A bushing well load	2
600 A bushing load	6

Load control	
None	X
Internal control	I
Elastimold motor control	M
Elastimold 80 control: TCCs select through E-Set software	F
Elastimold SCADA 80 control: TCCs select through E-Set software, SCADA ready	S
SEL 751A relay	H

Cam-Op, integral position indicator and Tru-Break™	
None	X
Cam-Ops load ways (600 A ways)	A
Cam-Ops source ways (600 A ways)	B
Cam-Ops all ways (on all 600 A ways)	C
Position indicators load ways (M&M)	D
Position indicators source ways (M&M)	E
Position indicators all ways (M&M)	F
Tru-Break source ways (600 A ways)	G
Tru-Break load ways (600 A ways)	H
Tru-Break all ways (600 A ways)	J

Labels and instructions language	
English labels and instructions	E
Spanish labels and instructions	S

Switchgear alphanumeric characters	0

Source controls	
None	X
Internal control	I
Elastimold motor control	M
Elastimold 80 control: TCCs select through E-Set software	F
Elastimold auto transfer control (ATS control)	A
SEL 751A relay	H
SEL 451 relay	G

Solid dielectric PT to power controls	
None	X
One (1) 15 kV PT (7000–7620 V AC (Wye)	A
One (1) 27 kV PT (13200–14400 V AC (Wye)	B
One (1) 38 kV PT (19000–20750 V AC (Wye)	C
One (1) 38 kV PT (34500–38000 V AC (Delta)	D
Two (2) 15 kV PT (7000–7620 V AC (Wye)	E
Two (2) 27 kV PT (13200–14400 V AC (Wye)	F
Two (2) 38 kV PT (19000–20750 V AC (Wye)	G

Enclosure material, enclosure color and ground bar	
None (subsurface)	X
Mild steel, Munsell green 7GY 3.29/1.5 & flat ground bar	A
Mild steel, Munsell Canadian green 9GY 1.5/2.6 & flat ground bar	B
Mild steel, Munsell green 7GY 3.29/1.5 & round ground bar	C
Mild steel, Munsell Canadian green 9GY 1.5/2.6 & round ground bar	D
Stainless steel, Munsell green 7GY 3.29/1.5 & flat ground bar	E
Stainless steel, Munsell Canadian green 9GY 1.5/2.6 & flat ground bar	F
Stainless steel, Munsell green 7GY 3.29/1.5 & round ground bar	G
Stainless steel, Munsell Canadian green 9GY 1.5/2.6 & round ground bar	H

Applications

Underground distribution switchgear

01 Similar application of MVS switches in loop configurations contribute to significantly reduce the outage duration. In these cases, single- or multi-way switch configurations can be applied.

Load switching is required when:

- A load needs to be isolated to perform maintenance on the line/circuit
- A load needs to be isolated to repair a fault
- A loop needs to be reconfigured to feed a certain load from a different substation and isolate the faulted portion of the loop

In any case, the use of a manual sectionalizer contributes to reduce the length of time that unfaulted or unaffected portions of the system are exposed to an outage. This results in improved reliability of the system as the duration of outages is reduced (i.e. the SAIDI and CAIDI reliability indices). Switching products can be applied as replacements for existing oil fuse cutouts or as manual sectionalizers for loops or radial feeders. Depending on the application, these sectionalizers may be installed in a vault or inside a padmount enclosure. Pole installations are also available.

Without manual sectionalizing

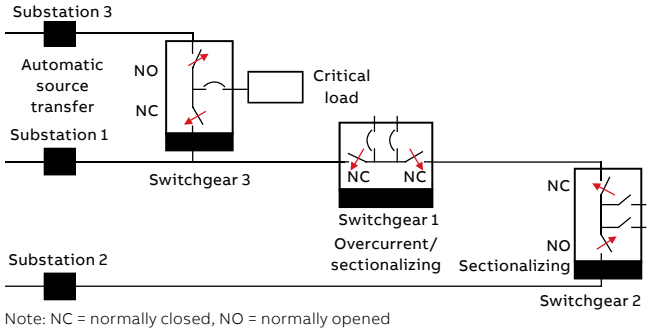
- No manual sectionalizing unit
- Permanent faults F1 and F2
- Interruption duration: F1 = 1 hr.; F2 = 2 hr.
- Evaluation period = 1 yr.
- SAIDI = [(1 hr.) x (1000) + (2 hr.) x (1000)]/1000 = 3 hr./yr.
- SAIFI = [1000 + 1000]/1000 = 2 interruptions/yr.

In this example, a radial feeder is exposed to two failures in one year. Without any manual sectionalizing, all customers are subject to both failures and are out of power until failures are restored. Assuming that the duration of outage one (F1) is 1 hour, and outage 2 (F2) is 2 hours, the calculation of SAIDI shows 3 hours of interruption duration per year.

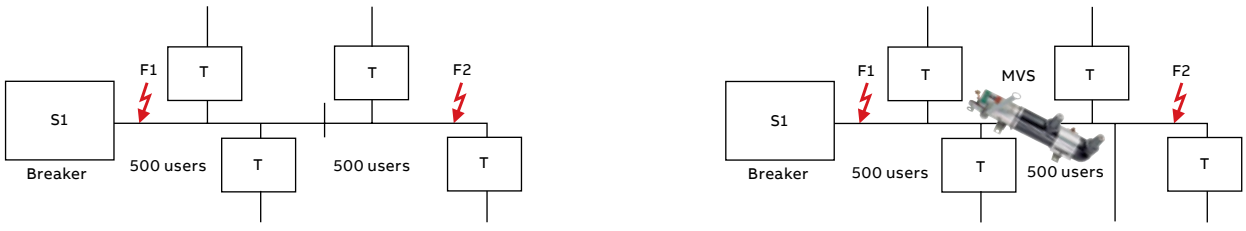
With MVS manual sectionalizing – Improved reliability!

- MVS manual sectionalizing unit = Shorter restoration time for 500 customers
- Permanent faults F1 and F2
- Interruption duration: F1 = 1 hr.; F2 = 2 hr. for 500 users; F2 = 1 hr. for 500 users
- Evaluation period = 1 yr.
- SAIDI = [(1 hr.) x (1000) + (1 hr.) x (500) + (2 hr.) x (500)]/1000 = 2.5 hr./yr.
- SAIFI = [1000 + 1000]/1000 = 2 interruptions/yr.

With the use of an MVS at the midpoint of the feeder, the restoration time is reduced. Once the fault is located, the MVS is open to isolate the faulted portion of the feeder. At this point, the other half of the feeder can be energized, reducing the outage duration or SAIDI from 3 hours to 2.5 hours per year (16.6%).



Note: NC = normally closed, NO = normally opened



01

Applications

Underground distribution switchgear

Fault-interrupting devices are used on:

- Feeders to sectionalize, so that if there is a fault, only a small section of the load is affected
- Radial taps deriving from a main feeder or loop, so that a fault on a tap is isolated from the main circuit
- Network transformers to isolate the devices in case of overcurrent, excessive pressure/ temperature, etc.

While a switching device contributes to decrease the duration of outages, fault interrupters contribute to decrease the duration AND frequency of outages (i.e. SAIDI, CAIDI, SAIFI, CAIFI reliability indices).

Without manual or automatic sectionalizing

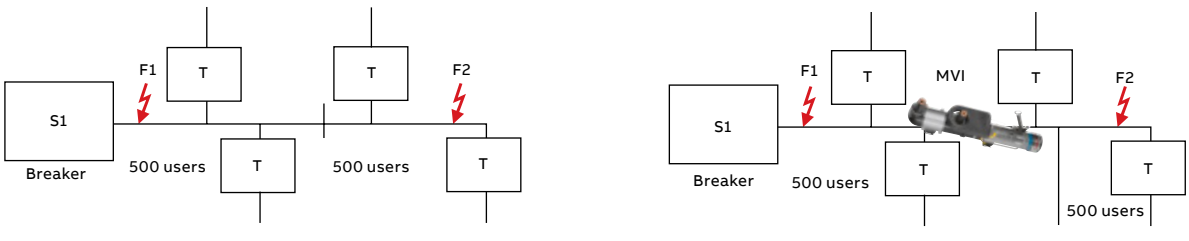
- No automatic sectionalizing unit
- Permanent faults F1 and F2
- Interruption duration: F1 = 1 hr.; F2 = 2 hr.
- Evaluation period = 1 yr.
- SAIDI = [(1 hr.) x (1000) + (2 hr.) x (1000)]/1000 = 3 hr./yr.
- SAIFI = [1000 + 1000]/1000 = 2 interruptions/yr.

In this example, a radial feeder is exposed to two failures in one year. Without any automatic sectionalizing (overcurrent protection), all customers are subject to both failures and are out of power until failures are restored. Assuming that the duration of outage one (F1) is 1 hour, and outage two (F2) is 2 hours, the calculation of SAIDI shows 3 hours of interruption duration per year. The calculation of the frequency of interruptions (SAIFI) shows two interruptions per year.

With MVI automatic sectionalizing – Improved reliability!

- MVI automatic sectionalizing unit = Eliminate one interruption for 500 users
- Permanent faults F1 and F2
- Interruption duration: F1 = 1 hr.; F2 = 2 hr. for 500 users
- Evaluation period = 1 yr.
- SAIDI = [(1 hr.) x (1000) + (2 hr.) x (500)]/1000 = 2 hr./yr.
- SAIFI = [1000 + 500]/1000 = 1.5 interruptions/yr.

With the use of an MVI overcurrent fault-interrupting device at the midpoint of the feeder, failure F2 only affects half of the load. Proper protection coordination between the MVI and the substation breaker enables the MVI to clear the fault before any customers between the MVI and the breaker are affected. Frequency and duration of interruption are significantly reduced. SAIDI is reduced from 3 to 2 hours of interruption per year (33%), and SAIFI is reduced from 2 to 1.5 interruptions per year (25%).



Steps 2 & 3

Applications

Distribution automation solutions and automatic source transfer systems

—
01 Elastimold
ATS control

Products that adapt to ever-changing system load conditions.

Distribution automation solutions
Tighter reliability, efficiency and loading requirements of the power system result in the need to keep costs at a minimum. Bringing more automation and intelligence to the power grid network to address numerous power utility concerns – ranging from reducing operational expenses to meeting new regulatory requirements – has prompted migration toward the next generation of distribution and substation automation.

Elastimold™ distribution automation products provide automation solutions for real-time monitoring of critical feeders, reducing outage duration and supporting the shifting of loads between sources to alleviate overload conditions. These products offer a complete solution package, including Elastimold switchgear and Schweitzer Engineering Laboratories (SEL) controls such as the SEL* 451, for interoperability and rapid automation implementation. Elastimold™ distribution automation solutions include:

Automatic source transfer (preferred/alternate) loop automation (fault detection, isolation and restoration – FDIR)

—
01

Automatic source transfer systems
The main application of source transfer packages is to transfer a load from one power source to another. In some cases, when the load is not critical, this is done manually with a switching device. In the case of critical loads for hospitals, financial institutions, manufacturing facilities and other loads involving computerized equipment, a fast transfer is required between the main (preferred) source and backup (alternate) source. It is important that the automatic source transfer not affect load operation because any interruption of the business process translates into costly production loss and setup time. The preferred and backup sources are normally utility feeders, but in some instances may be a generator.

Elastimold switchgear offers automatic transfer (AT) packages with motor operators and voltage sensors capable of performing a full transfer in less than two seconds. For even faster transfer requirements, the fast transfer option using a magnetic actuator mechanism enables switching in 6½ cycles, or approximately 110 milliseconds. In either case, the system monitors voltage on the preferred source and initiates a transfer when voltage drops below the acceptable level for the customer. At this point, the preferred source is disconnected and the alternate source is connected.

Loop automation systems
In the case of underground loops, the switching devices along the loop can be used to reconfigure the loop to perform automatic fault detection, isolation and service restoration (FDIR). Thus, regardless of fault location, the switches will isolate the faulted portion of the loop and restore service to the remaining customers.

* SEL is a trademark of Schweitzer Engineering Laboratories, Inc.

Applications

Distribution automation solutions and automatic source transfer systems

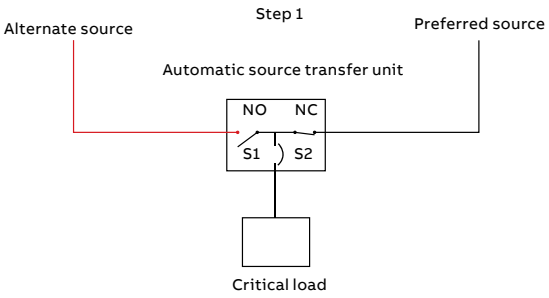
01 SEL 451 control package

01

Elastimold™ switchgear combined with SEL* controls provides the scheme of the future

The opportunity to drop in a complete automation package enables utility companies to create highly reliable commercial and industrial parks in locations subject to frequent and possibly extended outages. The FDIR scheme allows restoration in only a few seconds, minimizing traditional restoration issues and associated loss of productivity and revenue, and provides the following key benefits:

- Automatic detection of the open point of the loop
- Automatic reconfiguration of the loop to restore power to the load
- Ability to enable or disable the automatic network restoration scheme from any unit
- Infinite expandability – no limit to the number of units that can be installed
- No need for overcurrent protection coordination upon reconfiguration
- SCADA system interface: fiber optic, Ethernet and radio



Under normal operating conditions, the critical load is connected to the preferred source through S2. If power from the preferred source is lost due to an upline fault, the automatic source transfer unit detects the loss of voltage on S2. It automatically opens S2 and closes S1 to energize the critical load from the alternate source. With fast transfer, switching can be accomplished in 6½ cycles – or about 110 milliseconds.

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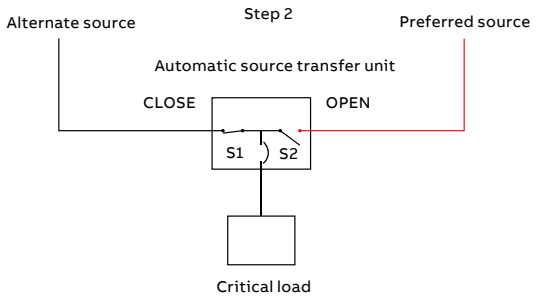


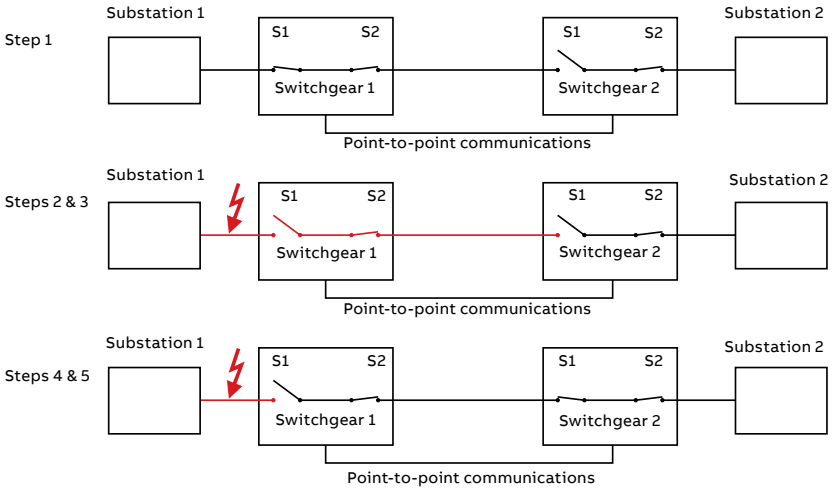
Applications
Operational scenarios

Operational scenario examples

Set-up and system normal state
- Loop automation scheme with two or more Elastimold™ multi-way switchgear units
- Loop is fed from two different sources
- One piece of switchgear serves as the normally open point in the loop
- Each multi-way switchgear is automated with the SEL451-5
- Source switches have overcurrent fault-protection capabilities
- Each multi-way switchgear senses:
  - Current on all phases and on all ways
  - Voltage on both sides of the gear on the main loop

Operation scenario 1

Loss of voltage on one source due to an upstream fault
1. Normal state
2. SWG1-1 opens on loss of source voltage after time delay
3. Search for closest downline open switch
4. SWG2-1 closes to restore load
5. FDIR scheme disables itself

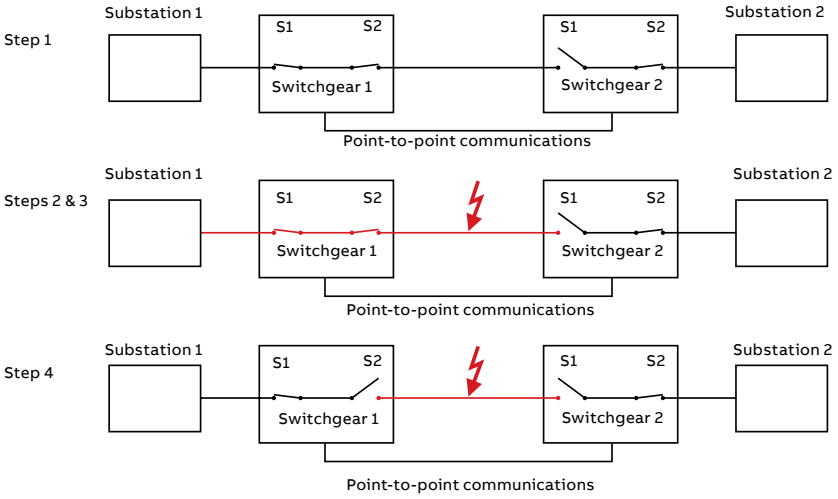


Applications
Operational scenarios

Operation scenario 2

Fault located between two automated switchgear units

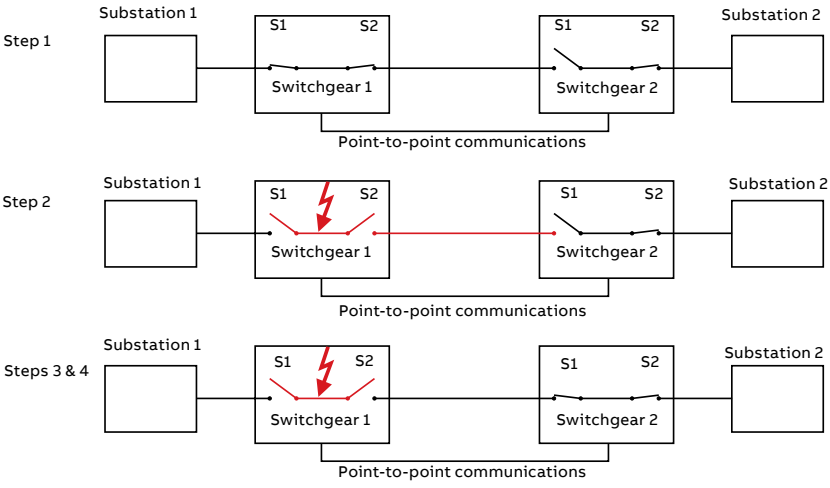
1. Normal state
2. WG1-2 times to trip; SWG1-1 tripping is momentarily blocked
3. Search for next downline switch
4. If switch is open, FDIR scheme disables itself, OR – if switch is closed, switch opens to isolate fault, searches for next downline open switch to restore load and FDIR scheme disables itself



Operation scenario 3

Bus fault within the switchgear

1. Normal state
2. SWG1-1 and SWG1-2 open
3. Close SWG2-1 to restore load between SWG1 and SWG2
4. FDIR scheme disables itself



Applications

Network transformer protection

01 Loss of redundancy can occur as a consequence of:
- Transformer fire
- Transformer overheating
- Transformer pressure build-up
- Overcurrent condition

The reliability of conventional radial or looped underground distribution circuits is measured in terms of the number and/or frequency of interruptions. These measurements cannot be directly applied to a network system. A typical network system has built-in redundancy. During most events, the continuity of power supplied to the end user is not affected by fault conditions on the high side of the network transformers. So, from the point of view of customer interruptions, network systems are reliable.

However, transformer failures have been known to result in catastrophic fires, explosions and even loss of lives. The failure or overload of multiple transformers within a network may ultimately result in the interruption of service to the end user.

Loss of redundancy
Loss of redundancy is a method that highlights the increased vulnerability of the system every time a network transformer is lost. Loss of redundancy indices are calculated as indicated in figure 2.

The number of transformers in the circuit is the number of transformers energized by the same feeder.

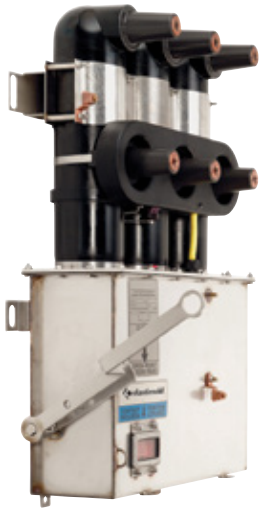
The loss of redundancy indices are calculated in the following example.

Example 1: No high-side transformer protection
Consider one substation breaker and one exclusive feeder out to the network. Five transformers are energized by the same feeder. Assume one permanent fault on one transformer in one year. Also assume the faulted transformer is de-energized for six hours (see figure 3).

Because there is only one breaker for five transformers, a failure in one transformer translates to the interruption of power to five transformers for six hours.

While the substation breaker may detect most overcurrent faults, faults caused by excessive pressure/heat or fires cannot be detected by the breaker. One method that automatically isolates a network transformer from the primary side, regardless of the type of failure, is the installation of an MVI fault interrupter on the high side of the transformer. This MVI can isolate based on overcurrent conditions, but also can be wired to isolate the transformer in case of fire, excessive pressure/heat, emergency signal, etc.

Benefits of such a setup to the network system and the end users include:
- Minimization of fire damage
- Reduction or elimination of transformer damage due to pressure or temperature build-up
- Longer transformer life



01

Duration of loss of redundancy (hours/year) =

$$\frac{\text{S (no. hours a transformer is disconnected}}{\text{x No. of transformers in the circuit)}}$$

Frequency of loss of redundancy (times/year) =

$$\frac{\text{Total no. of transformer de-energizations}}{\text{No. of transformers in the circuit}}$$

Duration of loss of redundancy (hours/year) =

$$\frac{(6 \times 5)}{5} = 6 \text{ hours/year}$$

Frequency of loss of redundancy (times/year) =

$$\frac{5}{5} = 1 \text{ time/year}$$

Applications

Network transformer protection

— 01 Transformer network with protection on the high side of the transformer

The following example calculates the loss of redundancy to the same system used in Example 1, but adding protection to the primary side of the transformers.

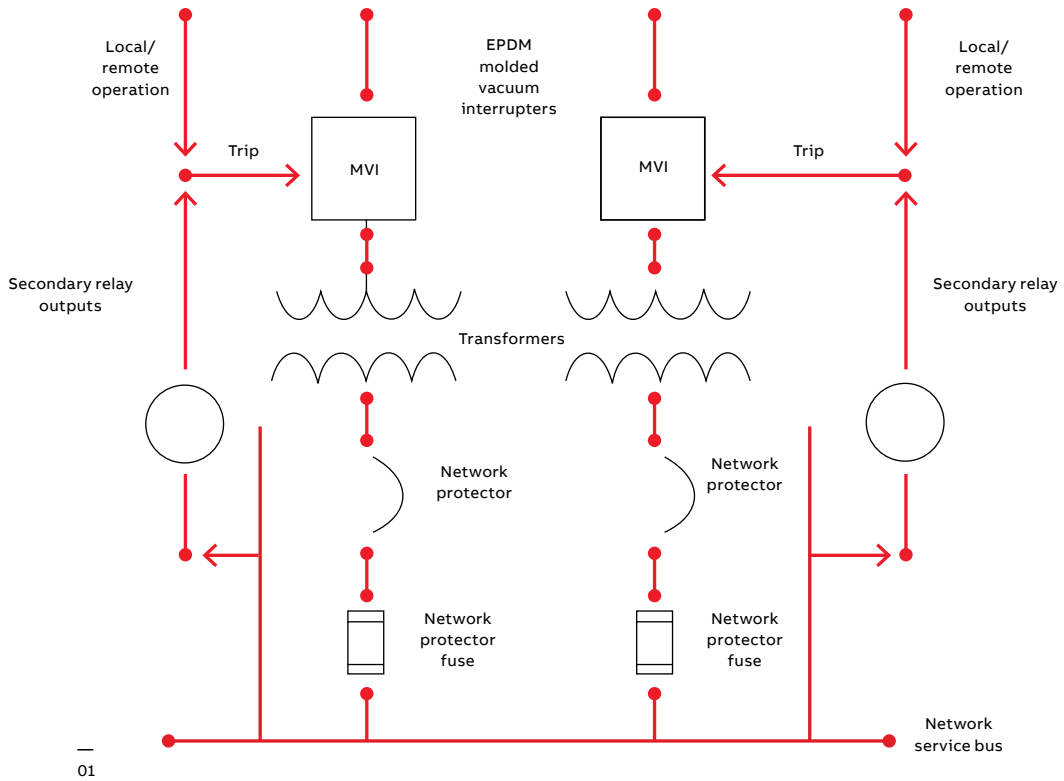
Example 2: High-side transformer protection
There is one substation breaker and one exclusive feeder out to the network. Five transformers are energized by the same feeder. Each transformer is equipped with a fault interrupter installed on the high side. Assume one permanent fault on one transformer in one year. Assume the transformer is de-energized for six hours (see figure 4).

A failure in one transformer translates to the interruption of power to only one transformer for six hours.

Once an MVI is installed, remote operation from the entrance of the vault or via SCADA is possible with the addition of a motor operator and control. Installation of panic/emergency push buttons at the entrance of the vault is also possible; pressing this emergency switch will instantaneously trip open one or all of the interrupters in a vault and isolate the transformers.

Duration of loss of redundancy (hours/year) = $\frac{(6 \times 1)}{5}$ = 1.2 hour/year

Frequency of loss of redundancy (times/year) = $\frac{1}{5}$ = 0.2 time/year

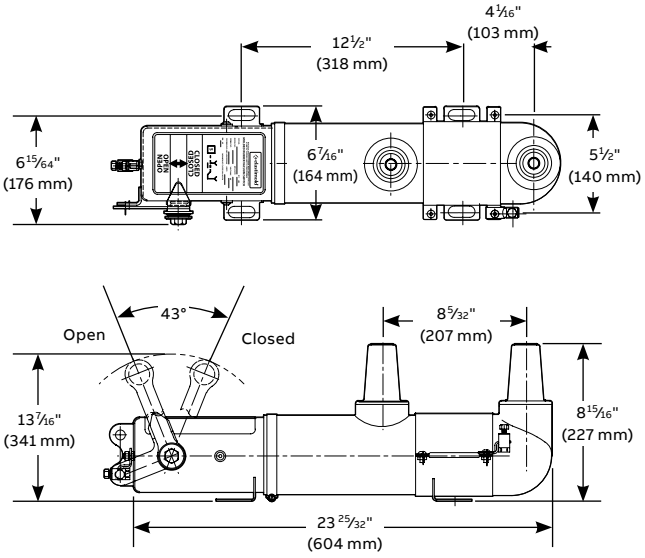


— 01

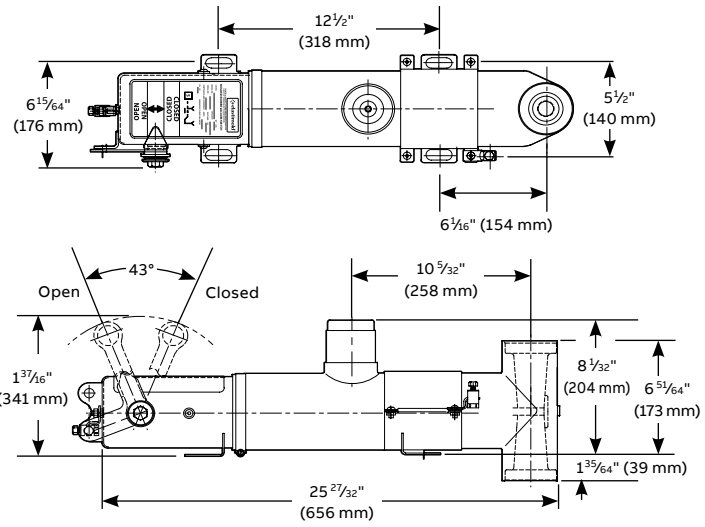
Product dimensions

MVS molded vacuum switches

Single-phase switches approximate weight: 30 lbs.



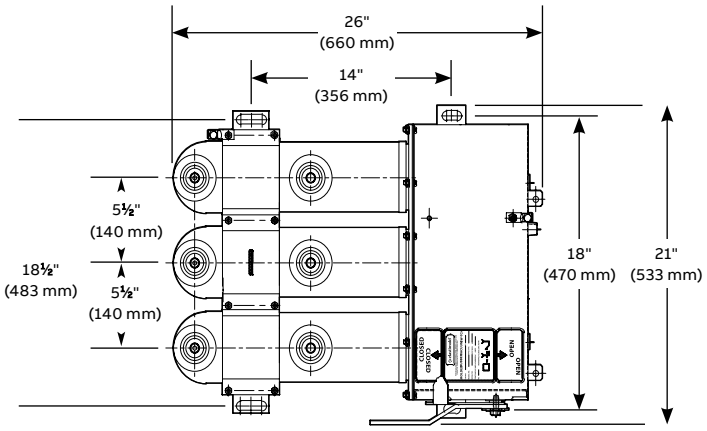
(4) Mounting holes, ⅝" dia. x ⅞" (16 x 22 mm)

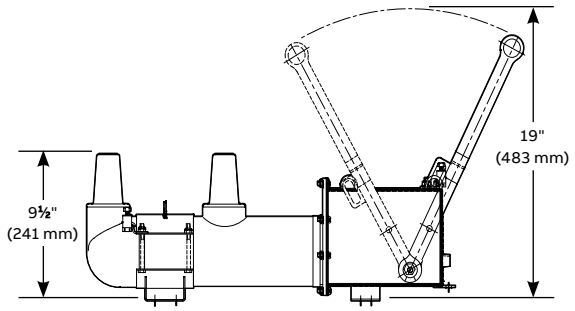


(4) Mounting holes, ⅝" dia. x ⅞" (16 x 22 mm)

Available with 600 A one-piece bushings or 200 A wells on either/both terminals.

Three-phase switches approximate weight: 135 lbs.



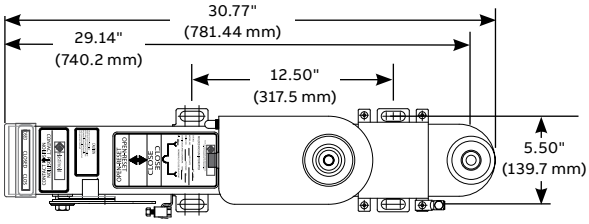


Available with 600 A one-piece bushings or 200 A wells on either/both terminals.

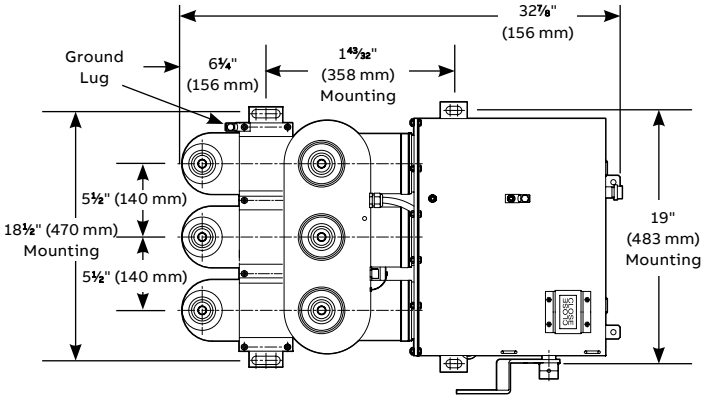
Product dimensions

MVI molded vacuum fault interrupters

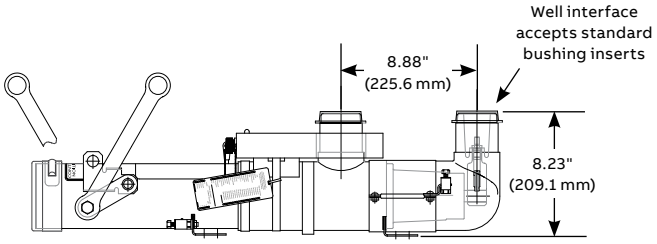
Front view single-phase



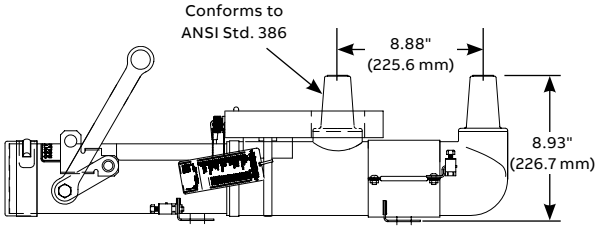
Front view three-phase



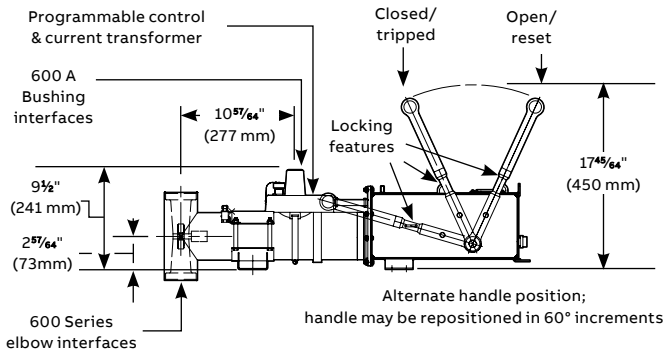
200 A wells



600 A bushings

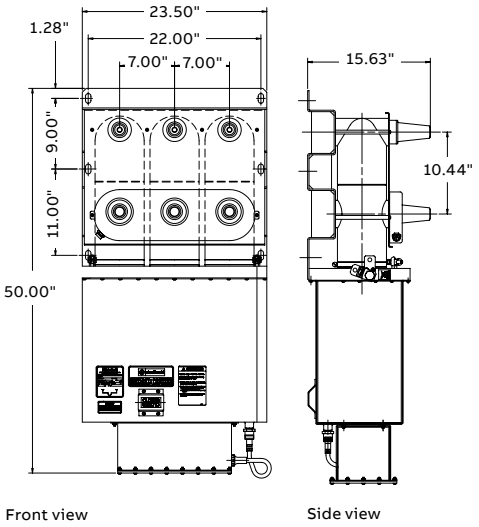


600 A T elbow interface



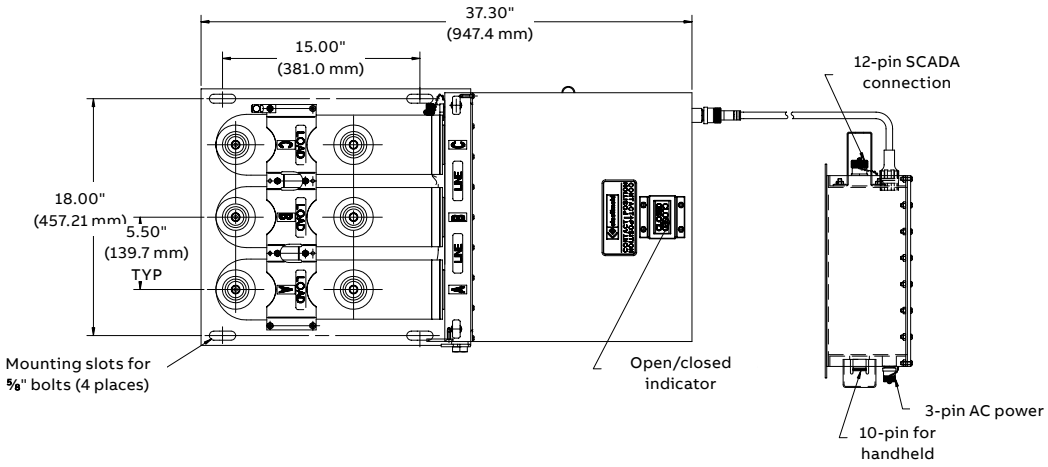
Product dimensions

38 kV/25 kA molded vacuum fault interrupters
Weight: 300 lbs.



Front view Side view

27 kV/40 kA molded vacuum switches

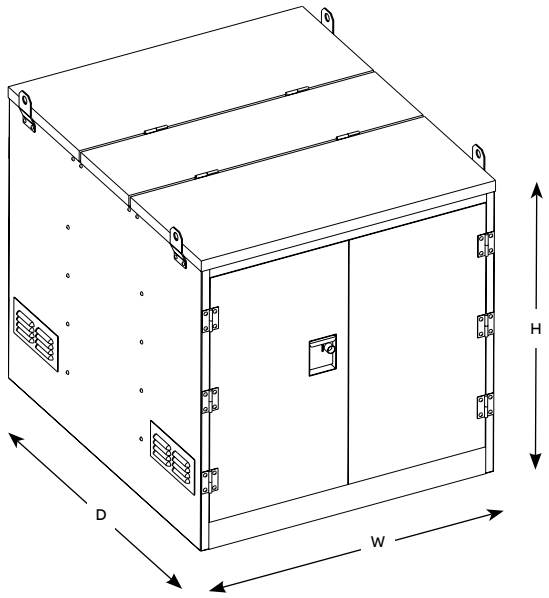


Product dimensions

Padmount switchgear enclosures

Cabinet sizes

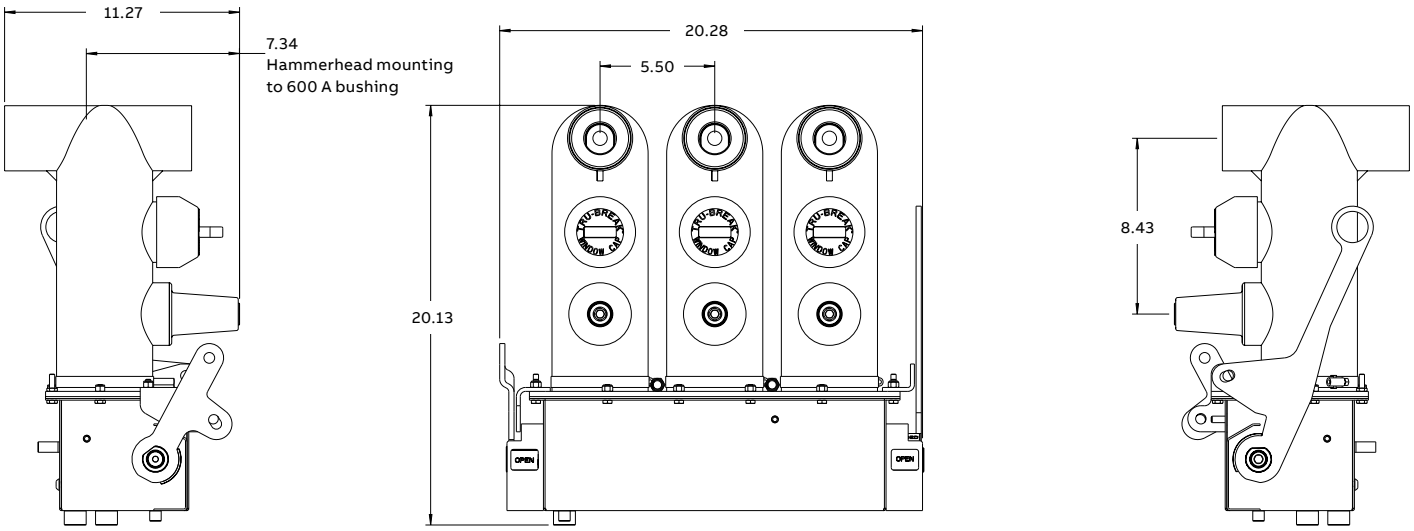
Cabinet dimension (in.)	Configuration
Double-sided 2-way/1 or 2 switchgear products – all voltage classes	
36 W x 64 D x 54 H	Manual gear or motors
48 W x 64 D x 54 H	(1) PT, motor, voltage sensors
Double-sided 3- and 4-ways – all voltage classes	
Lead time for delivery of final product	8–12 weeks target after Engineering
54 W x 64 D x 54 H	Manual gear or motors
64 W x 64 D x 60 H	(1) PT, motor, voltage sensors
74 W x 64 D x 60 H	(2) PTs, motor, voltage sensors
Double-sided 5- and 6-ways	
108 W x 82 D x 54 H	All units, 15 and 27 kV only
108 W x 88 D x 54 H	38 kV units only
Single-sided 2-way/1 switchgear product – all voltage classes	
60 W x 30 D x 42 H	Manual gear or motors
72 W x 40 D x 42 H	(1) PT only
Single-sided 2-way/2 switchgear products – all voltage classes	
60 W x 40 D x 64 H	Manual gear or motors
72 W x 40 D x 64 H	(1) or (2) PTs, motors, voltage sensors
Single-sided 3-way	
88 W x 40 D x 64 H	Manual gear or motors
100 W x 40 D x 64 H	(1) or (2) PTs, motors, voltage sensors
Single-sided 4-way	
114 W x 40 D x 64 H	Manual gear or motors
126 W x 40 D x 64 H	(1) or (2) PTs, motors, voltage sensors
Single-sided 5-way	
142 W x 40 D x 64 H	Manual gear or motors
154 W x 40 D x 64 H	(1) or (2) PTs, motors, voltage sensors
Single-sided 6-way	
170 W x 40 D x 64 H	Manual gear or motors
182 W x 40 D x 64 H	(1) or (2) PTs, motors, voltage sensors



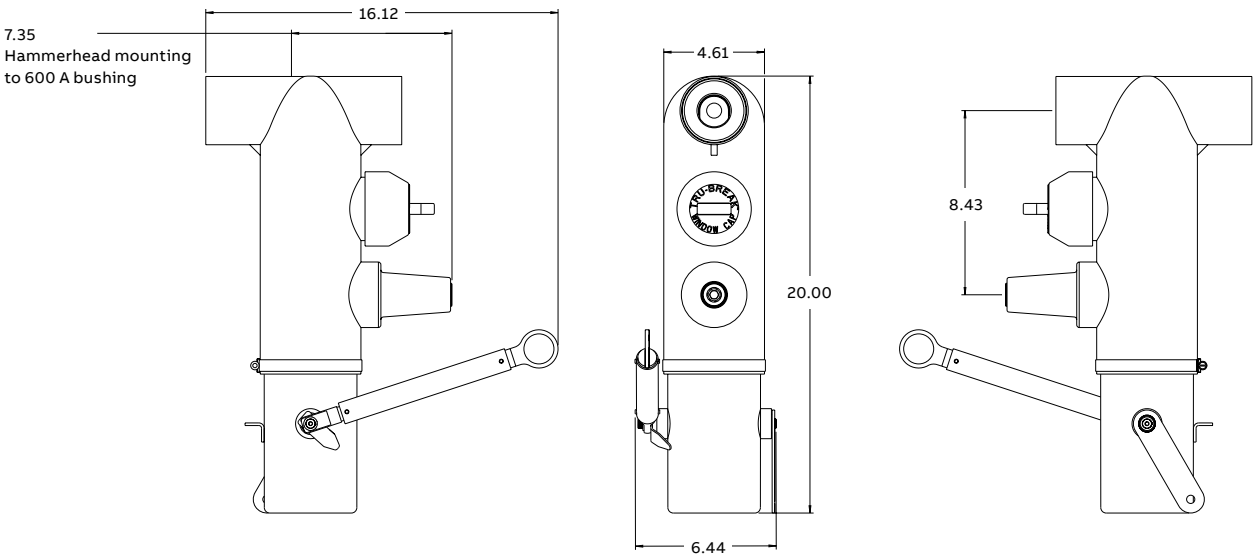
Product dimensions

Tru-Break switchgear module

Three-phase Tru-Break switchgear module



Single-phase Tru-Break switchgear module



Tru-Break switchgear module dimensions

Width	Three-phase: 18 inches (457.2 mm) Single-phase: 6.5 inches (165.1 mm)
Height	20 inches (508.0 mm)
Weight	Three-phase: 97 lb (44 kg) Single-phase: 25 lb (12 kg)

Note: Dimensions shown on drawings above are in inches. All dimensions are approximate.

Molded vacuum reclosers

Single- and three-phase molded vacuum reclosers, 15–38 kV

The recloser you want, all in one package.
The need for automated reclosers has never been greater, but many of today's reclosers come with penalties. They weigh too much, and that makes them difficult to install. They aren't easy to upgrade, so you have to guess about what features to include in case you need them several years from now. What's more, if the recloser you stock doesn't come with superior technical support, service and built-in quality, you may find it worse than no recloser at all.

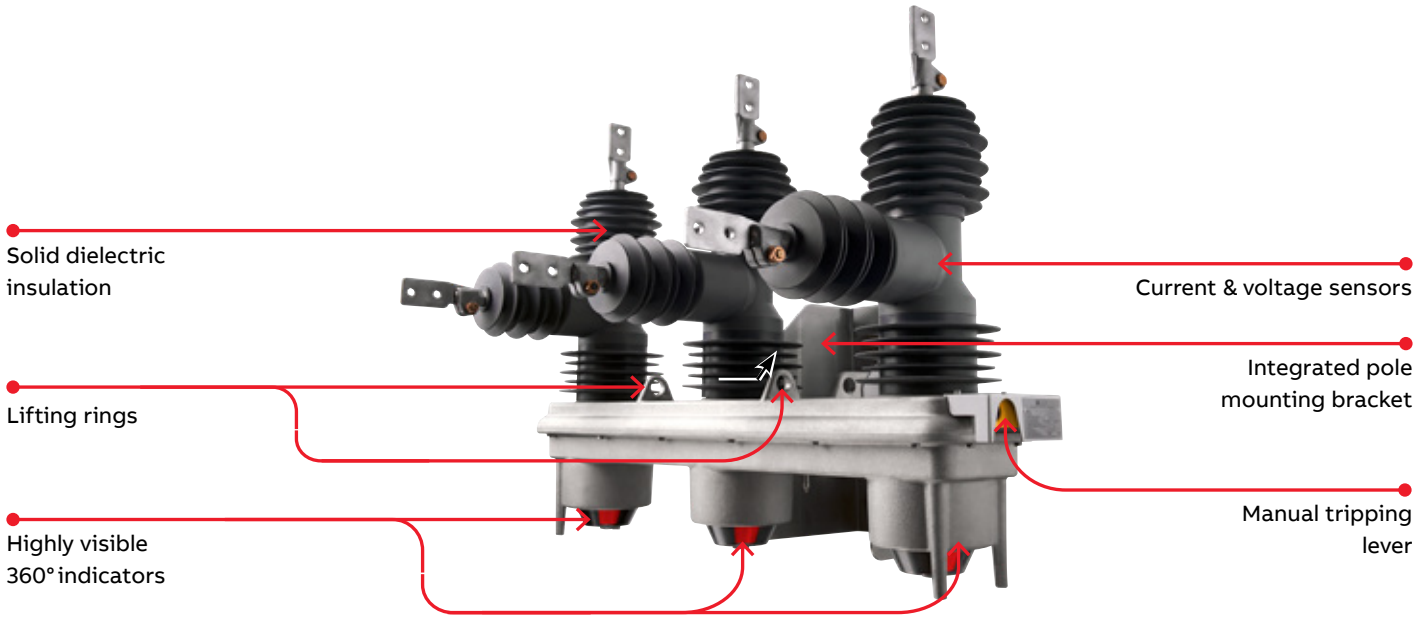
Elastimold™ molded vaccum reclosers address all of these problems, and more.

Elastimold molded vaccum reclosers are 33% lighter than typical units today, so they're easier and less expensive to install. Modular design means smart grid sensors can be added quickly and simply. Our reclosers are compatible with SEL* controls, the best in the business. Elastimold customer support, technical expertise and collaborative working relationships with customers mean that you will have the information you need, exactly when you need it.

*SEL is a trademark of Schweitzer Engineering Laboratories, Inc.

Smart, light and flexible.
Elastimold reclosers are world-class, by design. They respond to every hardware requirement that utilities want, and then some.

- **Smart** – Our reclosers are smart grid ready with three integral load-side voltage sensors and provision to add source-side voltage sensors, if desired. They were designed to be fully compatible with the industry's No.1 name in controls, Schweitzer Engineering Laboratories.
- **Light** – The three-phase Elastimold reclosers weigh 33% less than existing typical units. The simplicity of the mechanism design, and the compactness of the encapsulated components, contribute to making Elastimold reclosers easier to move and install.
- **Flexible** – Elastimold reclosers are modular, so field upgrades and retrofits are easy and fast. The single-phase reclosers have a pole rotation mounting bracket for easier installation.
- **Made with your needs in mind** – We designed our reclosers only after extensive talks with electric utilities. Their features, from easier-to-see open/close indicators to the many robust extra features that we consider "standard," are there because of you.



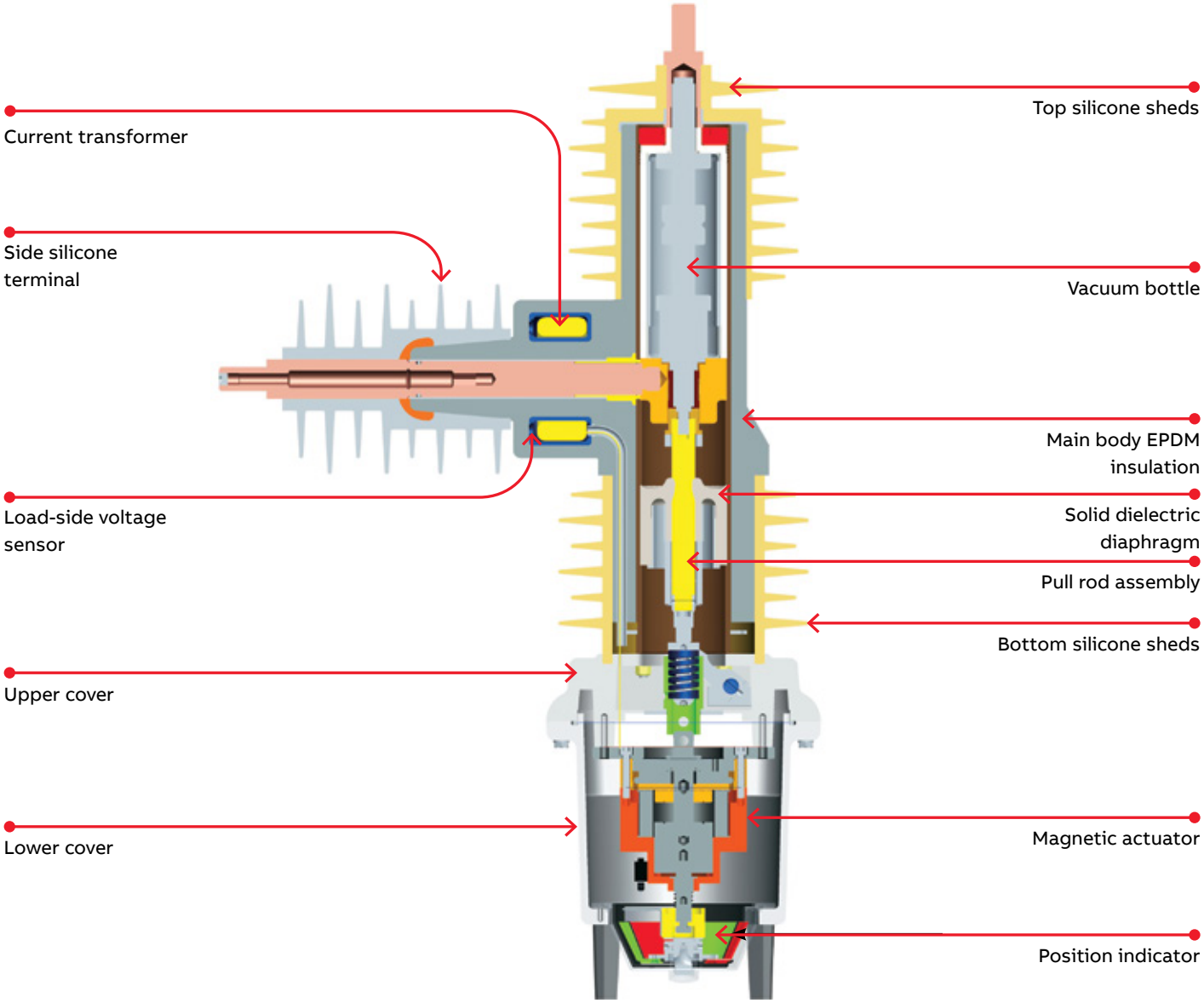
Molded vacuum reclosers

Recloser construction

The Elastimold™ molded vacuum recloser (MVR) operates electrically by energizing a magnetic actuator system with a completely sealed housing. Each pole contains a vacuum interrupter sealed in solid dielectric insulation for mechanical and high dielectric strength.

An open-closed position indicator provides a 360° view. An external manual trip assembly is located on the side; when in the down position, it maintains the recloser in a lockout position until it is manually restored. All electrical control connections are made through a sealed single-environment control cable connector on the side.

The combination of the molded vacuum recloser with microprocessor controls accurately detects a wide range of line disturbances and provides reliable, high-speed isolation for adverse conditions.

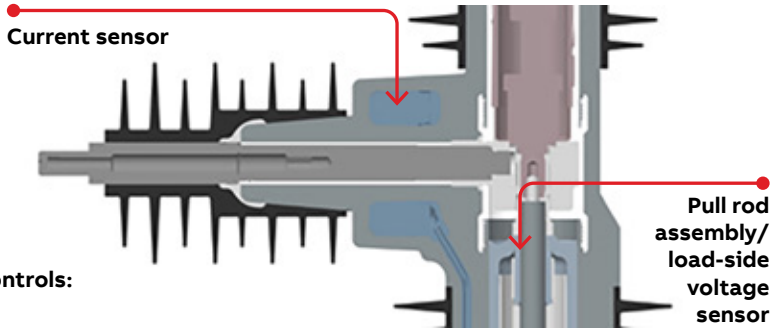


Molded vacuum reclosers

Features and benefits

Smart

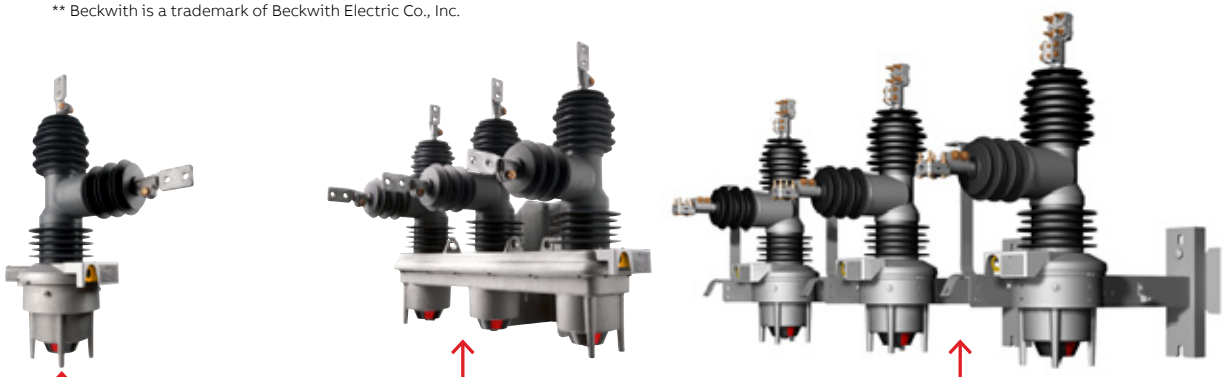
Smart grid ready
Integral current transformer (CT) (1000:1/500:1 flexibility) and load-side voltage sensors; with provisions to add Elastimold source-side voltage sensors.



Compatible with industry-leading controls:
SEL* controls
- SEL-351R
- SEL-351RS Kestrel*
- SEL-351R Falcon*
- SEL-651R-2

Beckwith ** controls
- M-7679 R-PAC

Notes: Use with the SEL-351R and SEL-351R Falcon requires connection via MVR power module.
The power module is connected to the recloser via a 6' 32-pin cable.
Voltage sensors require SEL-651R-2 control with six 8 V AC LEA inputs.
* SEL, Kestrel and Falcon are trademarks of Schweitzer Engineering Laboratories, Inc.
** Beckwith is a trademark of Beckwith Electric Co., Inc.



SEL-351RS Kestrel
10/14-pin cable

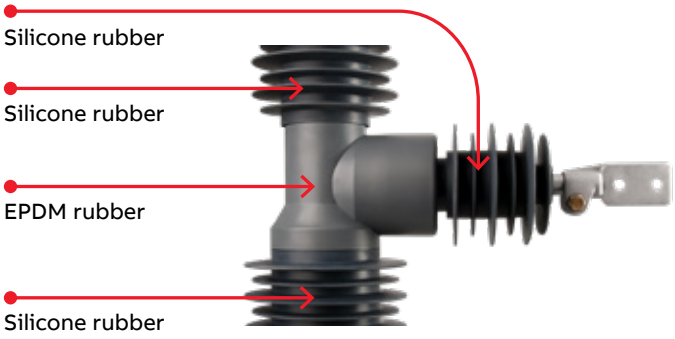
SEL-351R
14-pin cable

SEL-351R Falcon
14-pin cable

SEL-651R-2
32-pin cable

Beckwith M-7679 R-PAC
32-pin cable

Molded vacuum reclosers



Light

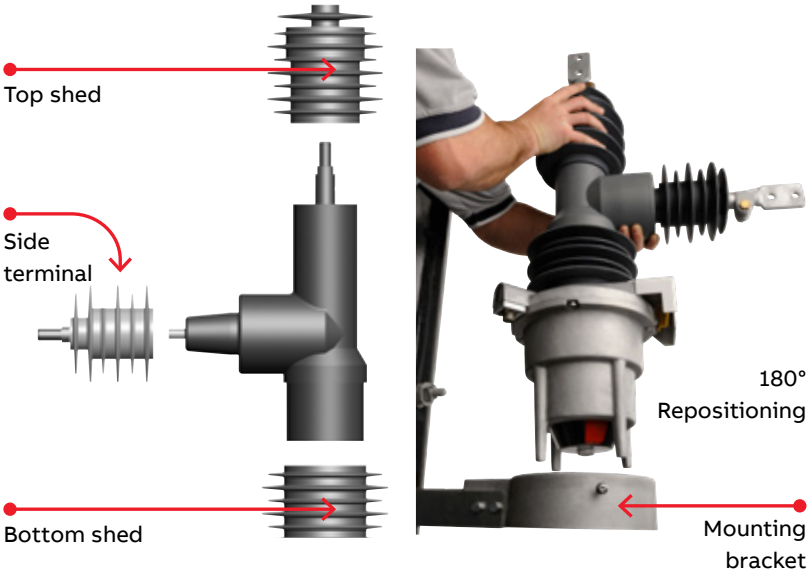
Lightweight
Internal diaphragm and silicone rubber sheds reduce weight

Proven solid dielectric insulation
Molded EPDM main body with overlapping silicone rubber sheds for improved dielectric weatherability and UV performance

Simplified mechanism
Translates into a lightweight device

Weight

		15 kV		27 kV		38 kV	
		Others standard	Elastimold standard	Others standard	Elastimold standard	Others standard	Elastimold standard
Single-phase	(lb.)	100	57	100	57	130	58
	(kg)	45	25.8	45	25.8	60	26.3
Three-phase	(lb.)	333	208	333	208	430	211
	(kg)	150	94.3	150	94.3	195	95.7



Flexible

Modular design
Optimized modular design is lightweight and maintenance free.
Design is modular and allows for individual pole or shed replacement if ever required

Pole rotation mount
The single-phase recloser has a unique pole rotation mounting bracket for easier installation and repositioning from 0° to 180°

Molded vacuum reclosers

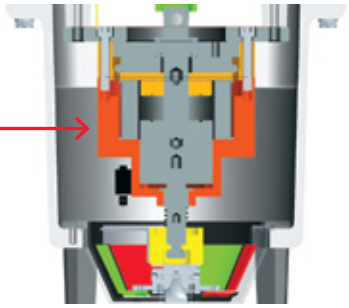
01 Closed indication

02 Open indication

01 02

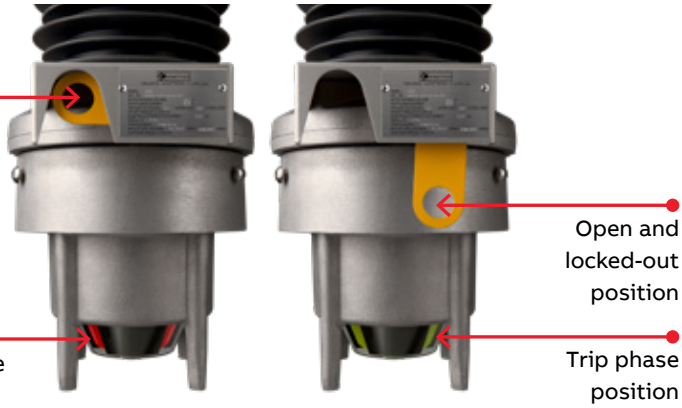
Easy-to-see position indicator

360° position indicator view with large color-coded reflective open/closed indicators on bottom of recloser for easy visibility from ground level



Reliable long-life mechanism

The state-of-the-art design of our magnetic actuator offers over 10,000 trip and close full-load operations with no maintenance required



Single- and three-phase tripping capabilities

The fast and highly reliable electrically ganged operation provides flexibility of simultaneous three-phase tripping or single-phase tripping with three-phase lockout

The manual trip lever is mechanically linked to trip and lockout all three phases simultaneously

Rated maximum voltage	15 kV		27 kV		38 kV	
	Others standard	Elastimold™ standard	Others standard	Elastimold standard	Others standard	Elastimold standard
Continuous current (A)	630	800	630	800	630	800
BIL (kV)	95	150	125	150	150	170

Reduced inventory items

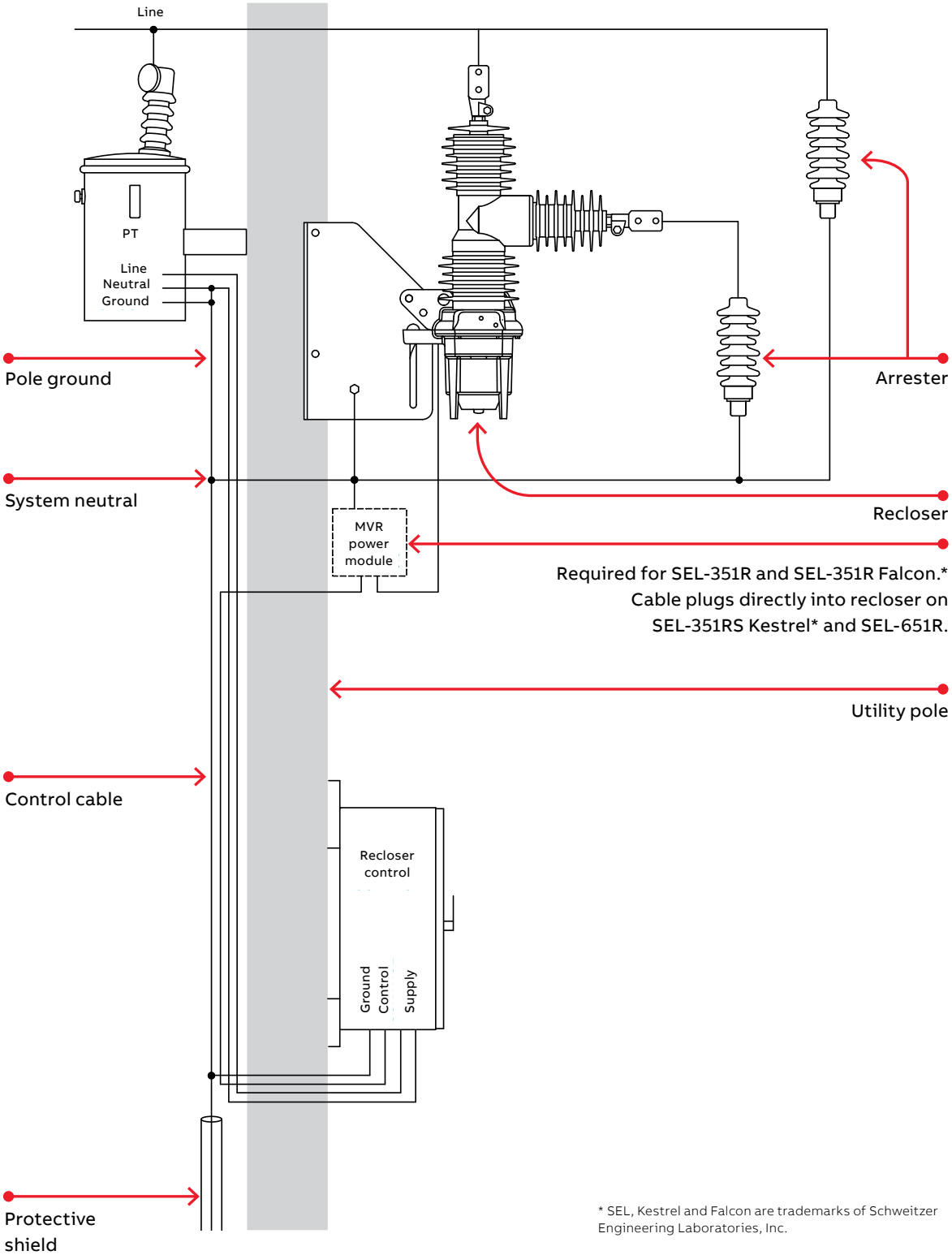
Incorporating extra features and extended capabilities as standard can lead to less stock on your floor

	15 kV				27 kV				38 kV			
	Required creep		Elastimold standard		Required creep		Elastimold standard		Required creep		Elastimold standard	
Pollution level	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
I – Light	9.8	248	–	–	17.0	432	–	–	23.9	608	–	–
II – Medium	12.2	310	–	–	21.3	540	–	–	30.0	760	–	–
III – Heavy	15.3	388	–	–	26.6	675	–	–	37.4	950	–	–
IV – Very heavy	18.9	481	41.5	1054	33.0	837	41.5	1054	46.4	1178	51.0	1295

Molded vacuum reclosers

Typical recloser installation

Arresters are recommended to provide protection against overvoltage conditions. When arresters are installed, they should be mounted on the supplied arrester brackets or as close to the recloser as practical.

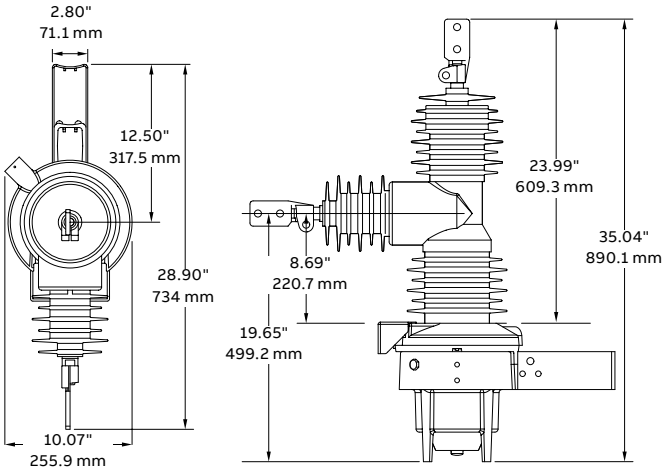


* SEL, Kestrel and Falcon are trademarks of Schweitzer Engineering Laboratories, Inc.

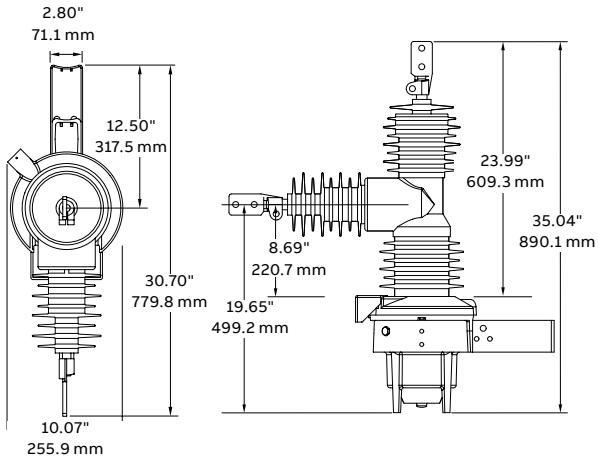
Molded vacuum reclosers

Dimensions for Elastimold™ single-phase molded vacuum reclosers

15 kV and 27 kV

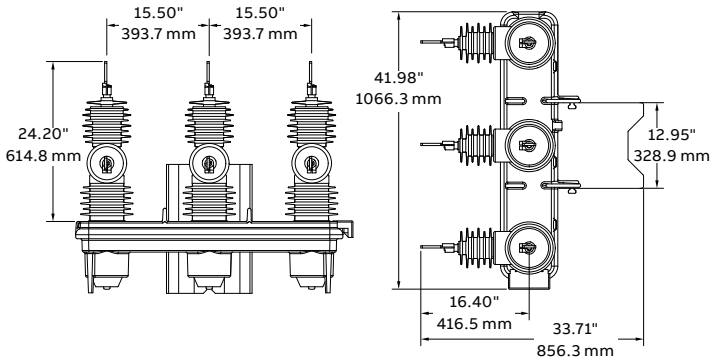


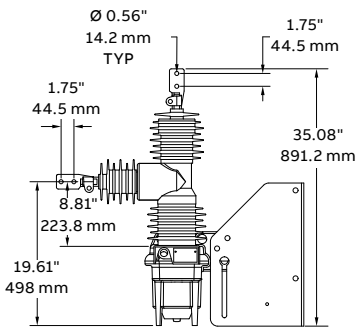
38 kV



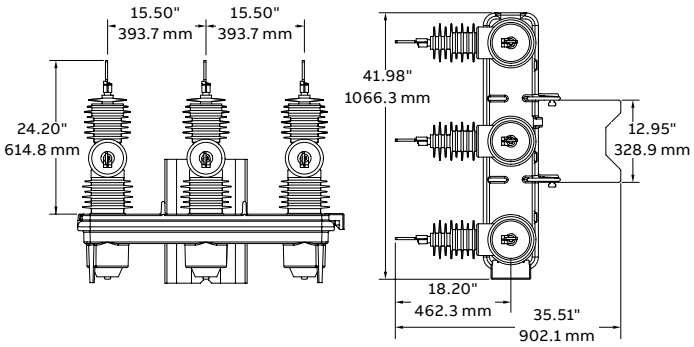
Dimensions for Elastimold three-phase molded vacuum reclosers

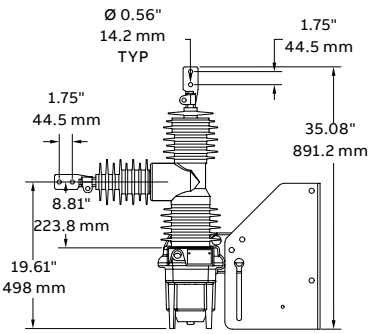
15 kV and 27 kV





38 kV

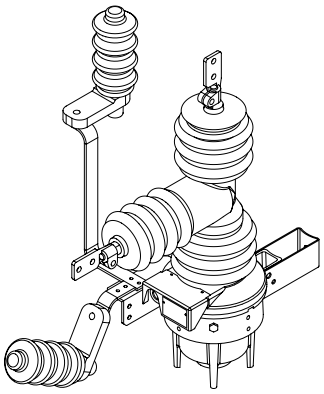


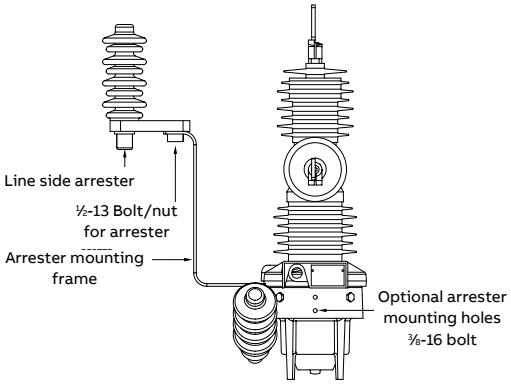


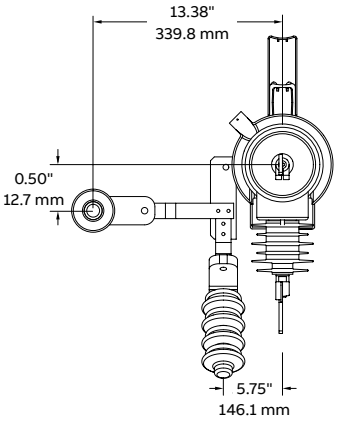
Molded vacuum reclosers

Typical pole-mounting installations

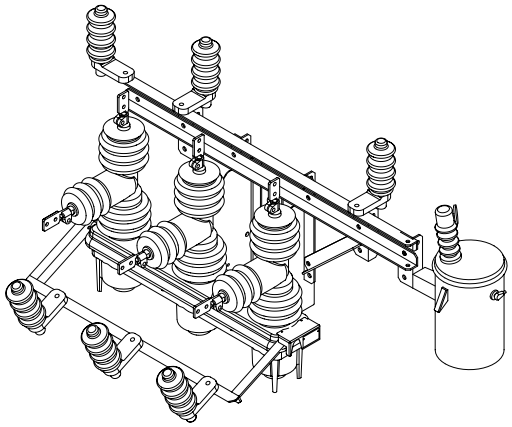
Single-phase recloser

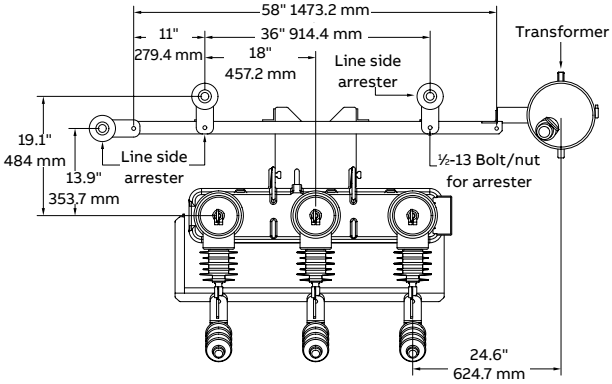


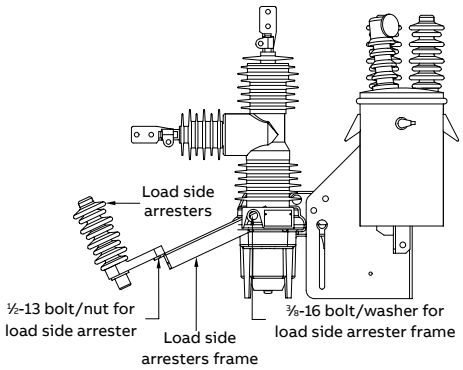




Three-phase recloser







Molded vacuum reclosers

Ratings and test data summary

Ratings

Description	15 kV	27 kV	38 kV*
Nominal system voltage (kV RMS)	14.4	25	35
Rated maximum voltage (kV RMS)	17.1	29.3	38
Nominal frequency (Hz)	50 or 60	50 or 60	50 or 60
Phase spacing on three-phase units (inches)	15.5	15.5	15.5
BIL (kV)	150	150	170
Power frequency withstand–dry (kV)	50	60	70
Power frequency withstand–wet (kV)	45	50	60
Continuous current (A RMS)	800	800	800
Eight-hour overload current (A RMS)	960	960	960
CT ratio	1,000 to 1	1,000 to 1	1,000 to 1
Interrupting current (kA RMS symmetrical)	12.5	12.5	12.5
Making current (kA asymmetrical peak)	32.5	32.5	32.5
Creepage distances (inches–line to ground)	41.5	41.5	51
Arc-extinction medium	Vacuum	Vacuum	Vacuum
Insulation medium	EPDM/Silicon rubber	EPDM/Silicon rubber	EPDM/Silicon rubber
Mechanical operations	10,000	10,000	10,000
Operating temperatures	-40 °C to 65 °C	-40 °C to 65 °C	-40 °C to 65 °C
Voltage sensor accuracy (load/line)	3% / 1%	3% / 1%	3% / 1%
CT accuracy	Class 1	Class 1	Class 1
Weight (single-phase/three-phase)	57 lb. / 208 lb.	57 lb. / 208 lb.	58 lb. / 211 lb.

* Single-phase 38 kV units are rated for use on grounded systems only.
Three-phase 38 kV units can be used for single-phase tripping on grounded systems only.
For ungrounded systems, three-phase tripping is required.

—
Elastimold MVRs are tested under the requirements of ANSI C37.60-2003. This table highlights the testing covered in Elastimold test report #372-17-12010:

—
Test data summary

C37.60-2003 Standard clause & description	15 kV MVR compliance	27 kV MVR compliance	38 kV MVR compliance
6.2 Insulation (dielectric) tests	●	●	●
6.3 Switching tests	●	●	●
6.4 Making current capability	●	●	●
6.5 Operating duty tests	●	●	●
6.6 Minimum tripping current tests	●	●	●
6.7 Partial discharge (corona) tests	●	●	●
6.10 Temperature rise tests	●	●	●
6.11 Time-current tests	●	●	●
6.12 Mechanical duty tests	●	●	●
6.13 Surge withstand capability (SWC) tests	●	●	●
Other testing UV/weathering tests	●	●	●
Other testing IEC 62217– Salt fog spray test (1,600 hours)	●	●	●

Molded vacuum reclosers

Catalog numbering system

The following diagram shows how to construct a catalog number for a molded vacuum recloser:

Indicates field that must be filled in to complete the full catalog number.

Indicates optional field

Product type	
Recloser	**R**

Voltage class Description	
15 kV	**1**
27 kV	**2**
38 kV	**3**

Phases Description	
Single phase	**1**
Three phase (single tank)	**3**
Triple single (3 - single)	**4**

Frame Description	
Pole mounting frame for MVR1	**1**
Pole mounting frame for MVR3	**3**
Adjustable height substation frame for 3-phase (single-tank)	**S**
Standard cluster mounting for triple single	**C**
Horizontal mounting frame for triple-single	**H**
Pole mounting for triple single	**P**
Vertical mounting for triple single	**V**
Custom frame	**F**

Number of control power transformers Description	
None (customer-supplied)	**X**
Single oil-filled CPT	**1**
Dual oil-filled CPT (applicable to 3-phase or triple-single)	**2**
Single dry-type PT	**3**
Dual dry-type PT (applicable to 3-phase or triple-single)	**4**

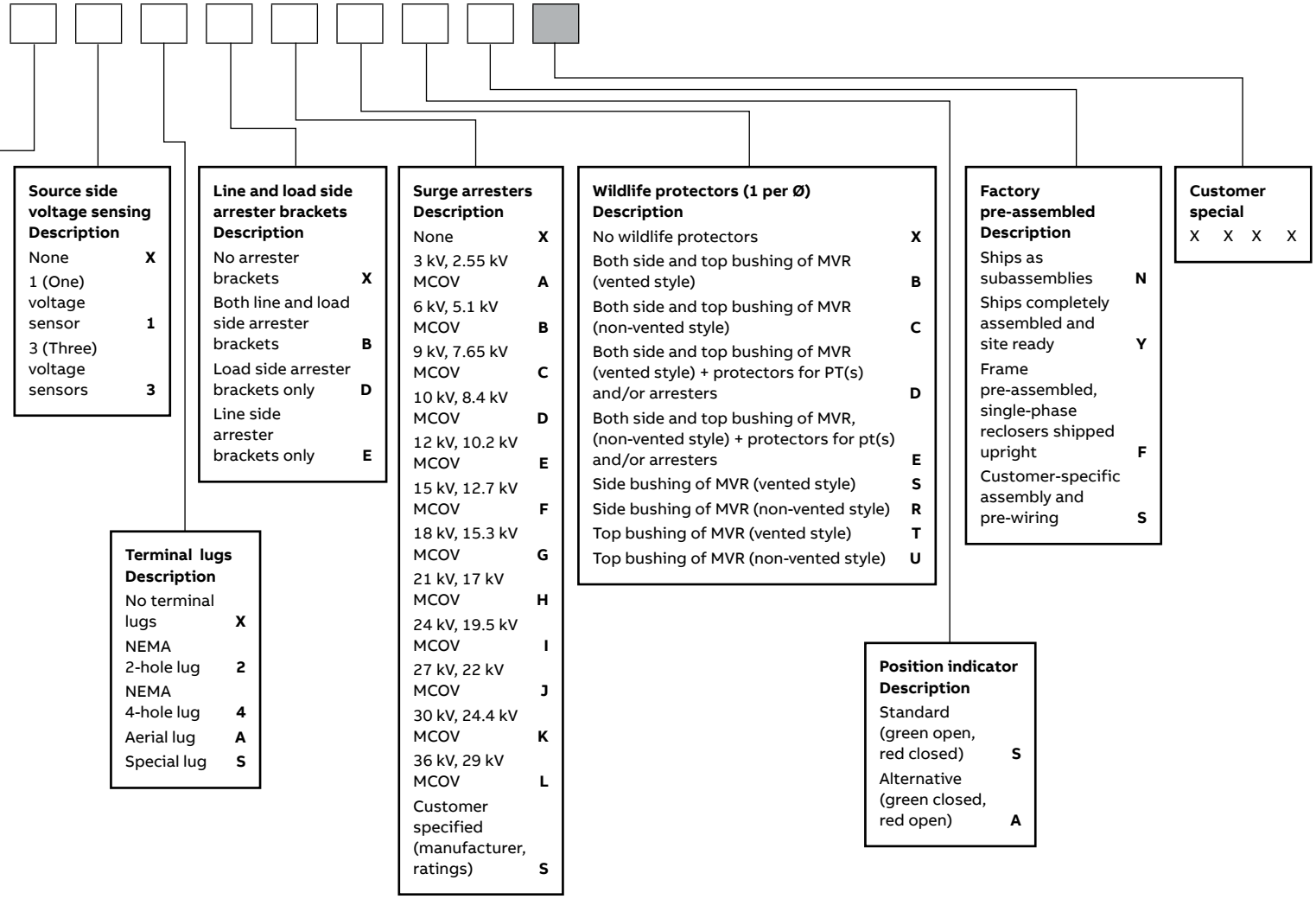
Control power transformer (CPT) Description	
None (customer-supplied)	**XX**
15 kV class	**1**
7200: 120 V, 1 kVA, 1PRI/1SEC (single bushing)	**1A**
7620: 120 V, 1 kVA, 1PRI/1SEC (single bushing)	**1B**
7960: 120 V, 1 kVA, 1PRI/1SEC (single bushing)	**1C**
13200: 120 V, 1 kVA, 2PRI/2SEC (two bushing)	**1D**
27 kV Class	**2**
13200: 120 V, 1 kVA, 1PRI/1SEC (single bushing)	**2A**
14400: 120 V, 1 kVA, 1PRI/1SEC (single bushing)	**2B**
13200: 120 V, 1 kVA, 2PRI/2SEC (two bushing)	**2C**
14400: 120 V, 1 kVA, 2PRI/2SEC (two bushing)	**2D**
38 kV class	**3**
19920:120 V, 1 kVA, 1PRI/1SEC (single bushing)	**3A**
4 kV class	**4**
2300:120 V, 1 kVA, 1PRI/1SEC (single bushing)	**4A**
2400:120 V, 1 kVA, 1PRI/1SEC (single bushing)	**4B**
Dual primary	
14,400 V/7200 V: 120 V (dual primary), 1 kVA	**DA**
Customer-specified PT	**CS**

Control model Description	
Ships without control (customer-supplied)	**X**
651R standard	**A**
651R premium	**B**
651R AC transfer (applicable with dual PTs)	**C**
651R customer selected	**D**
651R customer special	**E**
351R standard	**F**
351R premium	**G**
351R customer selected	**H**
351RS Kestrel standard	**I**
351RS Kestrel premium	**J**
351RS Kestrel customer selected	**K**
351R Falcon standard	**L**
351R Falcon premium	**M**
351R Falcon customer selected	**N**
Beckwith M-7679 R-PAC standard	**O**
Beckwith M-7679 R-PAC premium	**P**
Beckwith M-7679 R-PAC customer special	**Q**

Control cable length and type Description	
Unit ships without cable	**X**
6', standard (for single-phase only)	**A**
20', standard	**B**
25', standard	**C**
30', standard	**D**
35', standard	**E**
40', standard	**F**
45', standard	**G**
50', standard	**H**
60', standard	**I**
75', standard	**J**
100', standard	**K**
20', 1st 10' armored	**L**
25', 1st 10' armored	**M**
30', 1st 10' armored	**N**
35', 1st 10' armored	**O**
40', 1st 10' armored	**P**
45', 1st 10' armored	**Q**
50', 1st 10' armored	**R**
60', 1st 10' armored	**T**
75', 1st 10' armored	**U**
100', 1st 10' armored	**V**
20', full length armored	**W**
25', full length armored	**Y**
30', full length armored	**Z**
35', full length armored	**0**
40', full length armored	**1**
45', full length armored	**2**
50', full length armored	**3**
60', full length armored	**4**
75', 1st 10' armored	**5**
100', full length armored	**6**
Special cable	**S**

Notes:

- Single-phase reclosers function with the SEL-351RS Kestrel control. Three-phase reclosers function with SEL-651R-2, SEL-351R or SEL-351R Falcon controls. The MVR power module must be specified when using a SEL-351R or SEL-351R Falcon control.
- Load-side voltage sensors are standard on all units and function with any SEL control having at least three 8 V AC, 1M LEA inputs (LEA voltage inputs are not used with a SEL-351R or SEL-351R Falcon control). All units are upgradeable to source-side voltage sensing but require a SEL-651RX2XG control with six 8 V AC, 1M LEA inputs.



Source side voltage sensing
Description

None	**X**
1 (One) voltage sensor	**1**
3 (Three) voltage sensors	**3**

Terminal lugs
Description

No terminal lugs	**X**
NEMA 2-hole lug	**2**
NEMA 4-hole lug	**4**
Aerial lug	**A**
Special lug	**S**

Line and load side arrester brackets
Description

No arrester brackets	**X**
Both line and load side arrester brackets	**B**
Load side arrester brackets only	**D**
Line side arrester brackets only	**E**

Surge arresters
Description

None	**X**
3 kV, 2.55 kV MCOV	**A**
6 kV, 5.1 kV MCOV	**B**
9 kV, 7.65 kV MCOV	**C**
10 kV, 8.4 kV MCOV	**D**
12 kV, 10.2 kV MCOV	**E**
15 kV, 12.7 kV MCOV	**F**
18 kV, 15.3 kV MCOV	**G**
21 kV, 17 kV MCOV	**H**
24 kV, 19.5 kV MCOV	**I**
27 kV, 22 kV MCOV	**J**
30 kV, 24.4 kV MCOV	**K**
36 kV, 29 kV MCOV	**L**
Customer specified (manufacturer, ratings)	**S**

Wildlife protectors (1 per Ø)
Description

No wildlife protectors	**X**
Both side and top bushing of MVR (vented style)	**B**
Both side and top bushing of MVR (non-vented style)	**C**
Both side and top bushing of MVR (vented style) + protectors for PT(s) and/or arresters	**D**
Both side and top bushing of MVR, (non-vented style) + protectors for pt(s) and/or arresters	**E**
Side bushing of MVR (vented style)	**S**
Side bushing of MVR (non-vented style)	**R**
Top bushing of MVR (vented style)	**T**
Top bushing of MVR (non-vented style)	**U**

Position indicator
Description

Standard (green open, red closed)	**S**
Alternative (green closed, red open)	**A**

Factory pre-assembled
Description

Ships as subassemblies	**N**
Ships completely assembled and site ready	**Y**
Frame pre-assembled, single-phase reclosers shipped upright	**F**
Customer-specific assembly and pre-wiring	**S**

Customer special

X X X X

Control type	1-Phase	3-Phase	Triple-single
SEL-351RS Kestrel*	10/14-pin cable	X	X
SEL-351R	X	14-pin cable	X
SEL-351R Falcon*	X	14-pin cable	X
SEL-651R-2	X	32-pin cable	32-pin cable
Beckwith M-7679 R-PAC	X	32-pin cable	32-pin cable

Notes:
1. Use with the SEL-351R or SEL-351R Falcon control requires connection via MVR power module.
The power module is connected to the recloser via a 6 ft. 32-pin cable.
2. Voltage sensors require 8 V AC, 1M LEA inputs.
* SEL, Kestrel and Falcon are trademarks of Schweitzer Engineering Laboratories, Inc.

Molded vacuum reclosers
Accessories

Accessories

Cat. no.	Accessory name/description
3188D0120G1	Three-phase line-side arrester frame
3188D0121G1	Three-phase load-side arrester frame
3188C0122G1	Single-phase line-side arrester frame
3188C0123G1	Single-phase load-side arrester frame
3070A1191P1	Wildlife protector top bushing (one per phase)
3070A1190P1	Wildlife protector side bushing (one per phase)
3188C0075G1	Source-side voltage sensors (one per phase)
3188D0119G1	Substation mounting frame
3188B0126G1	NEMA 2-hole pad
3180A0661P1	NEMA 4-hole pad
3070B0913G1	Aerial lug
1548FH-ANC3JNAA	Fisher Pierce® overhead faulted circuit indicator – Adaptive Trip™; 4-hr. automatic reset time with current reset override (60 sec. after restoration of power), five ultra-bright LEDs for increased visibility display
1548FH-ANC3XNA1	Fisher Pierce overhead faulted circuit indicator – Adaptive Trip™; 4-hr. automatic reset time with current reset override (60 sec. after restoration of power), with 4-hr. temporary fault reset time, temporary fault indication option, four red and one amber LED

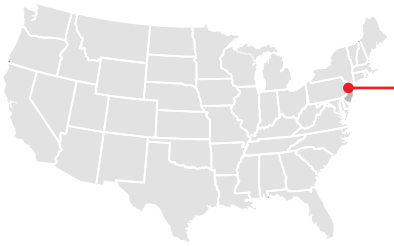
Appendix

Part number index

Notes

US
ABB Installation Products Inc.
Electrification business

electrification.us.abb.com



elastimold™

Elastimold™ switchgear, Tru-Break™ switchgear modules and reclosers are assembled in Hackettstown, NJ.

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