

HVL™ 5–38 kV Load Interrupter Switchgear

The Standard for Performance, Protection
and Dependability



by Schneider Electric



For a generation of engineers, Square D™ High Voltage Load (HVL™) Interrupter Switchgear by Schneider Electric has set the standard for performance, protection and dependability in metal-enclosed switchgear. From the beginning, we've had a reputation for quality, service and technical innovation.

Today, Schneider Electric continues to engineer, supply and service all the components of a unit substation.

[We believe in giving you choices]

Setting the Standard for Metal-enclosed Switchgear

Square D HVL 5–38 kV load interrupter switchgear from Schneider Electric is the most popular ANSI-rated switchgear in its class in America. Among medium voltage interrupter switchgear, both the switch and the enclosure stand as industry benchmarks in the areas of design, manufacturing and performance.

Load interrupter switchgear must perform a number of critical functions in a unit substation – protecting equipment and disconnecting faulted lines and transformers. Designed and tested to the latest applicable standards, HVL has been engineered to provide superior protection for your distribution system. That's why HVL switchgear is chosen for more installations than any other ANSI-rated load interrupter equipment.

HVL switchgear is available for various applications and configurations:

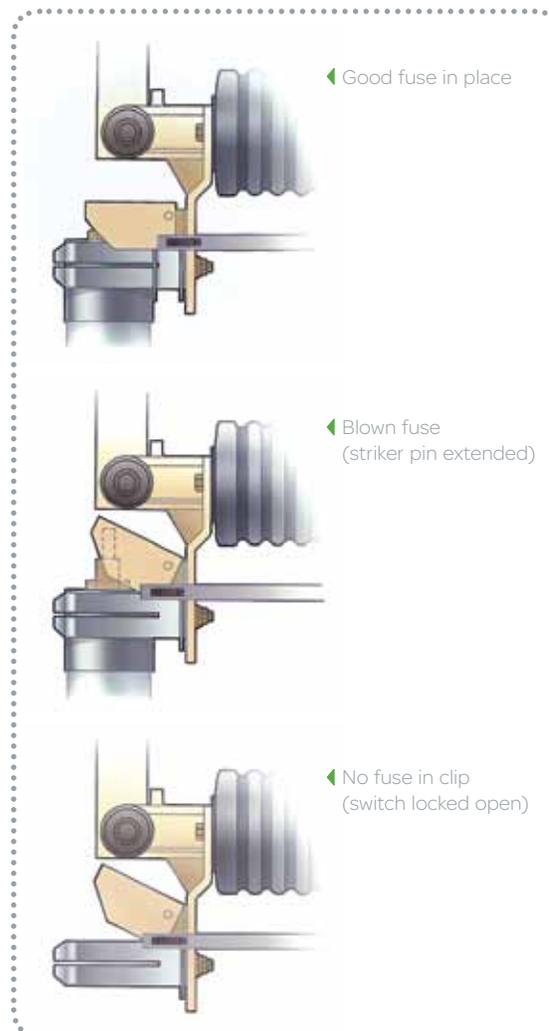
- Individual service entrance bays
- Multiple-bay lineups incorporating HVL load interrupters and optional VISI-VAC circuit interrupters
- Substation primaries
- Main-Tie-Main VISI-VAC circuit interrupters with HVL load interrupter switches as feeders

Square D metal-enclosed switchgear has become an industry standard for its superior system performance, low maintenance cost, easy system expansion and reduced system expense.

The Square D medium voltage current limiting fuse sets the standard for features and protection. The extended travel blown fuse indicator provides more travel to positively operate the optional FuseLogic™ protection system.

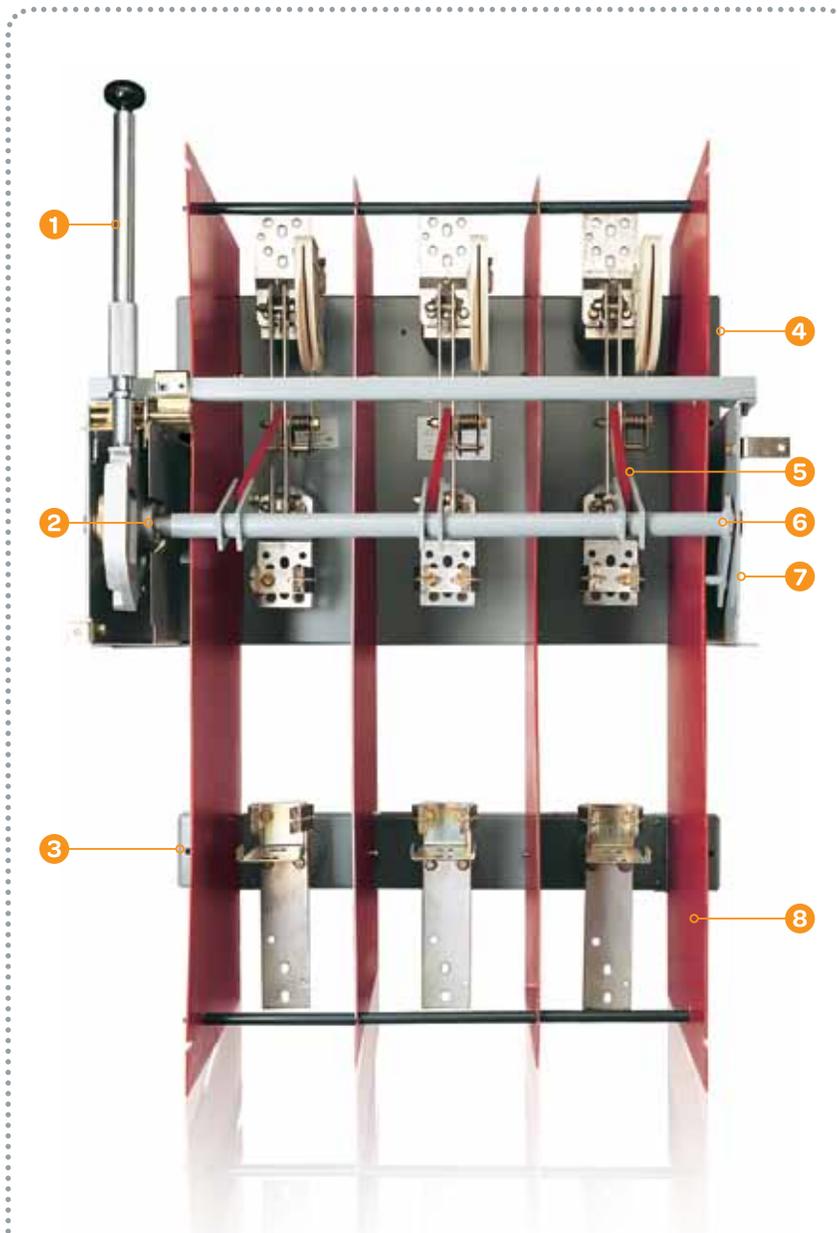
The FuseLogic protection system prevents closing of the HVL switch if a fuse is blown or has not been installed. This reduces operator error and the potential of equipment damage due to single phasing. The FuseLogic protection system can be used to operate auxiliary contacts for optional local and/or remote indication.

FuseLogic Direct Acting Fuse Tripping Sequence



HVL Switch

Square D HVL 5–38 kV Load Interrupter Switch



- 1 Permanently attached direct-acting handle with padlocking provisions in open and closed positions
- 2 Stored energy switch operating mechanism
- 3 Lower fuse clip assembly mounting channel
- 4 One-piece switch frame supports entire switch assembly
- 5 High strength glass-polyester insulating links with track resistant coating
- 6 Switch drive shaft and connecting linkage
- 7 Travel stop
- 8 Full length glass fiber reinforced polyester phase barriers

Solutions

When it came time to choose a contractor for a new joint-venture steel plant, the purchasing manager gave the \$4 million contract to Schneider Electric.

“I wanted the best engineering support, proven ability to meet schedules, technical contacts, open lines of communication and thorough follow-up,” he said. “I wanted the best value.” Schneider Electric provided 13.8 kV metal-clad and HVL load interrupter switchgear, 13.8 kV single-ended indoor unit substations, 13.8 kV three-phase, dry-type and oil-filled transformers and all the other equipment needed to handle more than fifty megawatts of electricity. The Schneider Electric reputation for quality was what made the difference, the purchasing manager said. “Our lines run 24 hours a day, seven days a week. The entire power distribution system has to work perfectly all the time.”

◀ Open style switch shown. The HVL switch is also available for OEM customers.

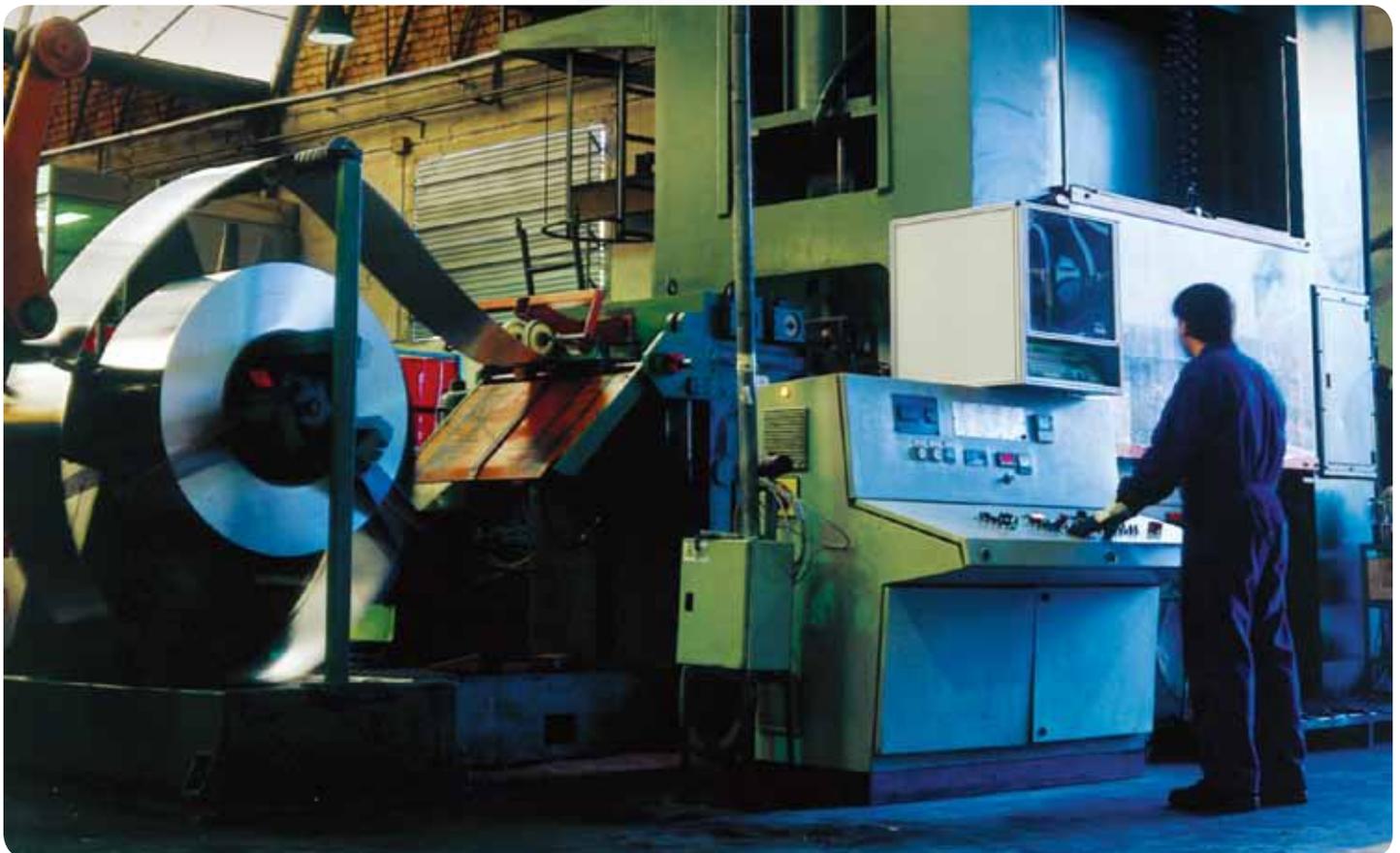
The Best Engineered Enclosure

The enclosure for the HVL 5–38 kV load interrupter switch is as carefully designed as the switch itself. It features the same rigorous engineering that goes into all Square D switchgear products. In fact, it's the same compact enclosure that's used for VISI-VAC switchgear.

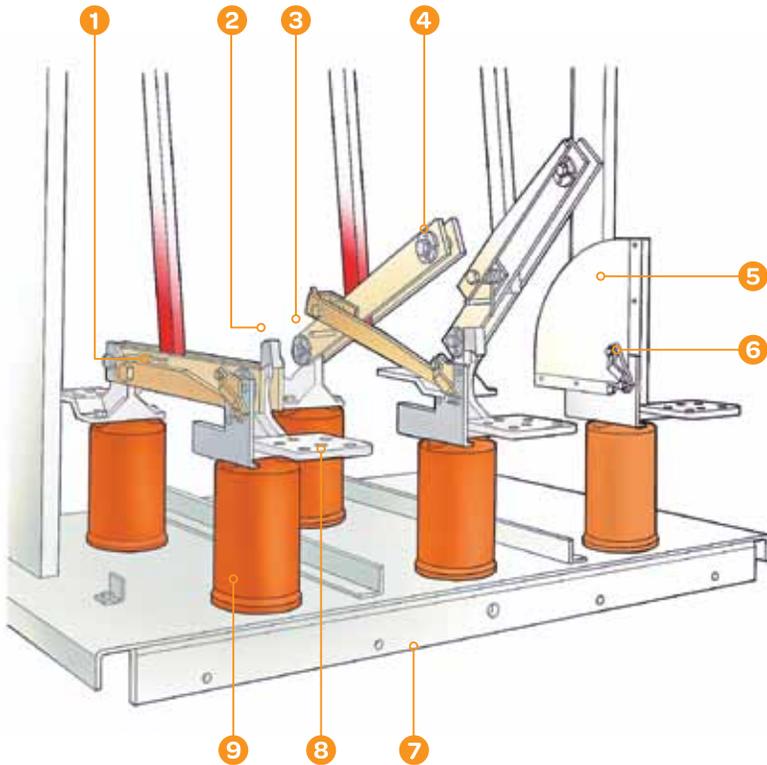
Our common enclosure, modular in construction, bolted and riveted for strength, allows for significant flexibility in configuring metal-enclosed switchgear. More flexibility gives you more options. For example, you can specify a duplex HVL configuration, and also include the increased function of a VISI-VAC circuit interrupter. In the same lineup, this common construction allows standardization of the cubicle and its associated components. It also permits the integration of the HVL load interrupter switch and the VISI-VAC circuit interrupter into a continuous, modular, space-efficient lineup.



◀ Indoor NEMA Type 1, 5/15 kV (left)
Outdoor NEMA Type 3R, 5/15 kV (right)



The Best Engineered Switch



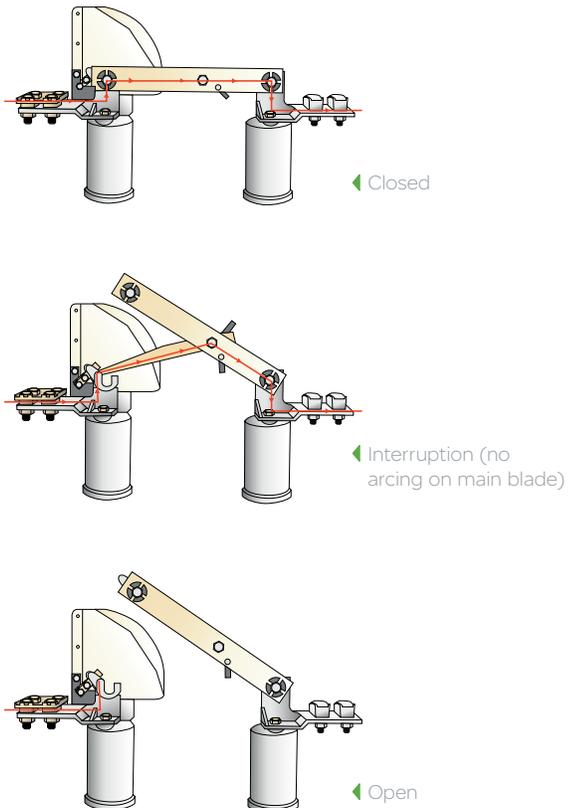
- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Arcing blade with copper tungsten tip 2 Stationary switch main contact with arcing tip which endures the closing arc 3 Limit stop to insure proper contact latch 4 Main movable contact consists of two silvered copper blades. Closing arc occurs at the blade ends – not in the main contact area 5 Arc chutes which help extinguish the arc | <ul style="list-style-type: none"> 6 Copper tungsten tipped stationary arcing contacts. Heat-resistant cantilever springs constantly maintain correct contact pressure 7 One-piece frame supports the entire assembly 8 Switch terminal connectors suitable for cable lugs or a bus connection 9 NEMA Class A-20/A-30 Supertrack (1500 min track resis) insulators |
|--|--|

An important design feature is the HVL load interrupter's direct-drive operating mechanism. Our engineers concluded that chain-drive systems were simply too unreliable, so they created a chainless direct drive. The result is one of the most dependable and consistent load interrupter switches in the industry.

The same spirit of engineering innovation can be seen in the way arc interruption is handled by the HVL switch. There are separate paths for current and for arcing. During the opening operation, the main blades completely disconnect and transfer the current to the arcing path. The arc is then forced to travel through the arc chute, where it is extinguished. This sequence of operation prevents erosion of the main contacts caused by arcing during the interruption of the load current.

To minimize the potential of catastrophic phase-to-phase faults, all live parts of HVL switchgear are mounted on insulators attached to the grounded sheet metal of the enclosure.

HVL Arc Interruption Sequence



Note: Red line indicates load current.

The enclosure containing the HVL load interrupter is available in single- or multiple-bay configurations. It can be close-coupled to a transformer for unit substation applications or to HVL/cc™. There are HVL enclosures (including walk-in enclosures) for both indoor (NEMA Type 1) and outdoor (NEMA Type 3R) applications.

The optional low voltage compartment mounted on the medium voltage door can contain power metering, pilot lights and customer LV terminal points.

The enclosures are constructed of 11-gauge formed steel and have the toughest finish in the industry – TGIC polyester powder paint. TGIC resins offer excellent mechanical properties, corrosion and exposure protection, edge coverage and are also environmentally friendly. TGIC polyester powder paint has proven to be superior to any other paint system available today. In addition, the enclosure door of HVL switchgear gives access only to the fuses when the switch is open. The blades can be viewed through a Lexan window mounted in the permanently attached upper panel.

Optional System Features

Transparent Ready™: Web-enabled Power and Control

HVL 5–38 kV load interrupter switchgear with PowerLogic™ circuit monitors and web-enabled Ethernet communication devices is a part of Square D by Schneider Electric's Transparent Ready power equipment family.

When specified as Transparent Ready, the power equipment is provided with a factory configured “plug and play” communications system that allows the authorized user access to equipment status and monitoring information using only a standard web browser. Ask your local Schneider Electric field sales representative for details about Transparent Ready power distribution equipment.



◀ Duplex configuration (transformer connection on right)

▶ The PowerLogic Series 4000 circuit monitor (CM4000) features all basic and advanced metering functions while providing a 0.04% typical accuracy rate



▶ The H.VIR COMET infrared inspection window

Optional Infrared Inspection Window

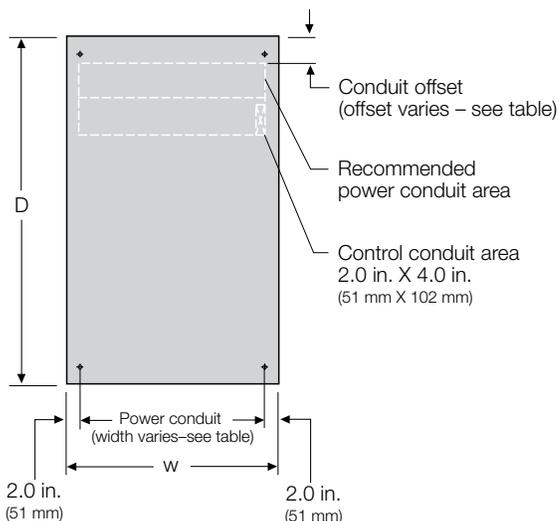
Ideal for installation in HVL 5–38 kV load interrupter switchgear, the H.VIR COMET™ infrared inspection window enables permanent access for electrical component inspection without disturbing operations. Specially developed for infrared inspections and distributed exclusively by Schneider Electric, the window is made of a glass-like material that is transparent for infrared rays. This product is a UL-recognized component for NEMA Type 3 and Type 12 equipment, and is available in 2 in., 3 in. and 4 in. diameters for either shortwave or longwave transmission.



The Best Service

Since a medium voltage load interrupter is essential to the dependable operation of a power distribution system, service and support are vital elements of a successful installation and continuing operation. Schneider Electric has one of the largest engineering and service teams in the industry to provide a level of support unmatched by any other manufacturer.

Dimensions



Layout Dimensions

| kV | Height in. (mm) | Width (W) in. (mm) | Depth (D) in. (mm) | Weight in. (mm) |
|--------------|--------------------|-----------------------|-----------------------|--------------------|
| 5/15 Indoor | 90.0 (2286) | 38.0 (965) | 54.5 (1384) | 1200 (545) |
| 5/15 Outdoor | 90.0 (2286) | 38.0 (965) | 46.5 (1181) | 1000 (454) |
| 25 Indoor | 114.0 (2896) | 48.0 (1219) | 80.0 (2032) | 2000 (908) |
| 25 Outdoor | 121.0 (3073) | 48.0 (1219) | 86.0 (2184) | 2500 (1135) |
| 29 Indoor | 114.0 (2896) | 48.0 (1219) | 80.0 (2032) | 2000 (908) |
| 29 Outdoor | 121.0 (3073) | 48.0 (1219) | 86.0 (2184) | 2500 (1135) |
| 38 Indoor | 120.0 (3048) | 60.0 (1524) | 80.0 (2032) | 2200 (999) |
| 38 Outdoor | 127.0 (3226) | 60.0 (1524) | 86.0 (2184) | 2700 (1226) |

Recommended Power Conduit Area

| kV Rating | Conduit Width in. (mm) | | Conduit Offset in. (mm) | |
|-----------|---------------------------|------------------|----------------------------|------------------|
| | Indoor (NEMA 1) | Outdoor (NEMA 3) | Indoor (NEMA 1) | Outdoor (NEMA 3) |
| 5-15 kV | 34 (864) | 34 (864) | 4 (102) | 6 (152) |
| 25 kV | 44 (1118) | 40 (1016) | 4 (102) | 4 (102) |
| 38 kV | 56 (1422) | 52 (1321) | 4 (102) | 4 (102) |

HVL Load Interrupter Switch Ratings

| | | | | | | | | | | | | | | | | |
|---|-------------------|------|------|-------------------|------|------|-------|------|------|-------|------|-----|-------|-----|-------|--|
| Nominal Voltage (kV) ^[1] | 4.16 | | | 13.8 | | | 16.5 | | | 24.9 | | | 29.0 | | 34.5 | |
| Maximum Design Voltage (kV) | 4.76 | | | 15.0 | | | 17.0 | | | 25.8 | | | 29.0 | | 38.0 | |
| BIL (kV) | 60 | | | 95 | | | 95 | | | 125 | | | 125 | | 150 | |
| Frequency (Hz) | 50/60 | | | 50/60 | | | 50/60 | | | 50/60 | | | 50/60 | | 50/60 | |
| Continuous Amperes | 600 | 1200 | 1200 | 600 | 1200 | 1200 | 600 | 600 | 1200 | 600 | 1200 | 600 | 1200 | 600 | 600 | |
| Interrupting Amperes | 600 | 1200 | 1200 | 600 | 1200 | 1200 | 600 | 600 | 1200 | 400 | | 400 | | 400 | | |
| Fault Close (kA asymmetrical rms) | 40 | 61 | 61 | 40 | 61 | 61 | 40 | 28 | | | 28 | | 20 | | | |
| Fault Close (kA symmetrical rms) | 25 | 38 | 38 | 25 | 38 | 38 | 25 | 17.5 | | | 17.5 | | 12.5 | | | |
| Momentary Current (kA asymmetrical 10 Cycle) | 40 ^[2] | 61 | 80 | 40 ^[2] | 61 | 80 | 40 | 40 | 61 | 40 | 61 | 40 | 61 | 40 | | |
| Capacitor Switching (kVAR) | 2400 | 2400 | — | 2400 | 2400 | — | — | — | | | — | | — | | | |
| Short-Time Current (kA 2 seconds) | 25 | 38 | 48 | 25 | 38 | 48 | 25 | 25 | | | 25 | | 25 | | | |
| Dielectric Withstand (kV 1 minute) | 19 | | | 36 | | | 36 | | | 60 | | | 60 | | 80 | |

^[1] 5-15 kV switches are UL Listed

^[2] 61 kA momentary current rating is available as an option

Note: Grayed areas are not UL Listed

 For additional information on HVL 5-38 kV load interrupter switchgear, contact your local Schneider Electric sales representative, or call 1-888-SQUARED.

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