# Switchgear

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</table>

![Power-Zone™ 4 Arc Resistant Low Voltage Switchgear with ArcBlok™ technology](image1)

![Medium Voltage Switchgear](image2)
Switchgear
Low Voltage Metal-Enclosed Drawout
Class 6037 / Refer to Catalogue 6037CT9901

Power-Zone™ 4 Low Voltage Switchgear
with Masterpact™ Circuit Breakers

The Square D® Power-Zone™ 4 low voltage metal-enclosed drawout switchgear is designed to provide superior electrical distribution, protection, and power quality management. The prime components of the switchgear are the Masterpact™ NW and NT circuit breakers. Power-Zone™ 4 switchgear is designed to provide economical basic circuit protection, which, in turn, deliver maximum uptime, system selectivity, ease of maintenance, and reliable circuit protection. All of these features are packed into the smallest footprint available for low voltage drawout switchgear:

• Power-Zone™ 4 is designed and built to ANSI C37.20.7, C37.20.1, CISA C22.2 No. 31-1, UL 1586
• Masterpact™ NW and NT draw low voltage power circuit breakers are designed and built to ANSI C37.13 and C37.16. Listed to UL 1095
• Short-circuit current rating up to 200 kA at 240Vac, 480Vac and up to 1000A at 600Vac without fuses
• High short-time withstand ratings up to 100 kA for 30 cycles, minimum
• Arc flash limiting (L1F) Masterpact™ NW feeder breakers available in 800, 1000, and 2000 ampere ratings
• Available in Arc Resistant construction certified to ANSI C37.20.7. Please refer to page DE12-3
• Optional Energy reduction maintenance switch
• Family of field installable and upgradable Micrologic® trip units with optional data communications features
• Power-Zone™ 4 switchgear can offer optional data communications capability:
  - Direct Ethernet Modbus TCP to each Circuit Breaker (P address per Circuit Breaker)
  - Modbus RS485 from each Circuit Breaker converted to Ethernet Modbus TCP in instrument compartment for customer Modbus TCP connection
  - Modbus RS485 Wired Out to instrument compartment for customer Modbus TCP connection
• Smallest equipment footprint available in this product class
• Front access to control and communications wire connections
• Bolted copper bus provided as standard (up to 6000 amperes maximum)
• Large rear cable compartment pull area allowing maximum room for power cables
• Horizontal flux provision for future equipment expansion
• System designed for maximum uptime with live maintenance.
• Modular circuit breaker designed for easy addition of control accessories.
• Masterpact™ NW circuit breakers are available in various levels of interrupting ratings from 40 to 200 kA at 480 volts and up to 130 kA at 600 volts. The Masterpact™ NT circuit breaker is available in an 800 ampere frame sizes and 42 kA at 480 volts interrupting rating. Up to 8 Masterpact™ NT circuit breakers can be mounted in a 30-inch wide section. (Not available for 600 volts.)
• Circuit breakers of the same frame sizes and interrupting ratings are interchangeable.

<table>
<thead>
<tr>
<th>Rating (A)</th>
<th>Masterpact™ NW</th>
<th>Catalogue No.</th>
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Micrologic® Trip Units
A modern family of field-installable trip units is available with Masterpact NW and NT circuit breakers. The circuit breaker overcurrent protection consists of a microprocessor-based trip device that requires no external power source. The complete tripping system has three main components, the air-core shunt, the trip actuator, and the trip actuator. The microprocessor-based trip unit uses true RMS current level sensing.

The Powerlogic® system is used in conjunction with Micrologic Type A, Type P, and Type H trip units for the Masterpact NW and NT circuit breakers. Modbus® Industry standard data communications allow the Powerlogic system to replace discrete meters, multiple transducers, analog wires, and analog-to-digital conversion equipment. Extensive information can be transmitted over a single communications cable to a Powerlogic system display, a personal computer, programmable logic controller, or other host system.

Basic circuit information, such as amperes, can be monitored using Micrologic Type A trip unit. Circuit breaker remote operation is available using the Micrologic Type P and Type H trip units with Powerlogic functionality. In addition to its metering capabilities, the Micrologic trip unit can send alarms and status reports to a remote host system. The trip unit can also send alarm and status reports to a remote host system. The trip unit can also send alarm and status reports to a remote host system.

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The Powerlogic® system is used in conjunction with Micrologic Type A, Type P, and Type H trip units for the Masterpact NW and NT circuit breakers. Modbus® Industry standard data communications allow the Powerlogic system to replace discrete meters, multiple transducers, analog wires, and analog-to-digital conversion equipment. Extensive information can be transmitted over a single communications cable to a Powerlogic system display, a personal computer, programmable logic controller, or other host system.

Basic circuit information, such as amperes, can be monitored using Micrologic Type A trip unit. Circuit breaker remote operation is available using the Micrologic Type P and Type H trip units with Powerlogic functionality. In addition to its metering capabilities, the Micrologic trip unit can send alarms and status reports to a remote host system. The trip unit can also send alarm and status reports to a remote host system. The trip unit can also send alarm and status reports to a remote host system.

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</tbody>
</table>
Power-Zone™ 4 Arc Resistant Switchgear with ArcBlok™ Technology

Protecting Your Personnel and Equipment from an Arc Flash

Power-Zone™ 4 arc resistant switchgear with Masterpact™ NW ArcBlok™ technology offers patented, superior arc flash protection for operators and maintenance personnel. The arc flash containment features are unique to the industry in both the circuit breaker compartment and the structure.

Power-Zone™ 4 Arc Resistant Switchgear with ArcBlok™ Technology is certified to comply with ANSI C37.20.7 IEEE Guide for Testing Metal-Enclosed Switchgear Rated Up to 38 kV for Internal Arcing Faults, and third-party (UL) witnessed as arc resistant switchgear. Refer to Data Bulletin 6037DB1302 for the complete UL Witness Certification Summary.

Features

• Masterpact™ NW circuit breakers with patented ArcBlok™ technology (up to 5000 A)
• Rated for systems with up to 100kA, 635V fault current
• 60 in. (1524 mm) deep x 22 in. (559 mm) wide (smallest arc resistant footprint in the industry)
• 22 in. (559 mm), 36 in. (914 mm) section widths
• 60 in. (1524 mm), 72 in. (1829 mm), 80 in. (2032 mm) section depths
• Internal arc gas management system for optimized cooling
• ANSI Type 2B Rating
• Type 1 enclosures

Available Options

• Insulated copper bus
• High-resistance grounding
• Zone selective interlocking
• Energy reduction maintenance switch
• Section barriers (rear, cable, and side)
• Circuit breaker remote racking
• ANSI Type 2B rated arc plenum exhaust
• Direct Ethernet Modbus TCP connection to each Circuit Breaker (IP address per Circuit Breaker)
Switchgear

Medium Voltage Metal-Enclosed—MiniBreak™
Class 6042 / Refer to Brochure 6042BR9401

MiniBreak™ Compact Height Switches—
5.5 kV—200 Amperes

The Square D® MiniBreak compact height switch enclosure is only 66-inches high and contains a single 3-pole load interrupter switch, rated 5.5 kV and 200 amperes. Enclosures are free-standing and suitable for both indoor (NEMA 1) and outdoor (NEMA 3R) applications. These switches are available unfused or with provisions for Square D® current-limiting fuses rated from 10E amperes to 200E amperes. Factory-installed accessories include an auxiliary switch, strip heaters, and provisions for a "lock open" only key interlock. The door is mechanically interlocked with the switch operating handle. Set screw cable lugs for #14 solid—2/0 stranded aluminum or copper cable are provided for two line and one load connections. Fuses are not furnished with this equipment. For fuse information and pricing see table below. The Fused switches and many of the fuses listed below are available from stock.

Note: 1200 horsepower maximum.

Ordering Information
1. Select switch catalogue number based on fused or unfused.
2. Select catalogue numbers for modifications from Factory Modifications table.
3. If fused, select 5 kV, 200 amperes maximum current-limiting fuse from table below.
4. Price switch and fuses separately. Switches are furnished with provisions only for fuses.
5. Weight 450 lbs (204 kg).

Current-Limiting Fuses Non-Disconnect Type
(Extended travel blown fuse indicator)
(Contact your nearest Schneider Electric sales office for Current Stock Quantities) Price Includes 1 Set of 3

<table>
<thead>
<tr>
<th>Continuous Current (kV)</th>
<th>Fuse Mounting Clip</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5 kV</td>
<td>D</td>
<td>5GS015</td>
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Factory Modifications

<table>
<thead>
<tr>
<th>Catalogue No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>HVMH1</td>
<td>Str ip heater 100 V</td>
</tr>
<tr>
<td>HVMH2</td>
<td>Str ip heater with thermostat 100 V</td>
</tr>
<tr>
<td>HVMSA3</td>
<td>Distribution class surge arrester (set of three arresters) 3 kV</td>
</tr>
<tr>
<td>HVMSA6</td>
<td>Distribution class surge arrester (set of three arresters) 6 kV</td>
</tr>
</tbody>
</table>

[Images of MiniBreak switch enclosure with door (class 6042) and side view (unfused)]

[Images of MiniBreak switch enclosure with fuses (class 6042) and side view (fused)]
HVL/cc Metal-Enclosed Load Interrupter Switchgear—Full Range

The Square D HVL/cc metal-enclosed load interrupter switchgear provides switching, metering, and interrupting capabilities for medium voltage electrical power distribution systems and is designed and tested per applicable ANSI/IEEE and NEMA standards.

Made up of modular units, the HVL/cc is easy to expand. Two main bus positions allow future extensions and connections to existing equipment.

The HVL/cc switchgear is available in either single or multiple bay units. The design is compact, with front accessibility.

The HVL/cc switch can be equipped with either an over-toggle mechanism (OTM), which is standard, or an optional stored energy mechanism (SEM). An option with both mechanisms is the Fuselogic™ system. The Fuselogic system offers fuse tripping (with SEM) to provide protection against single phasing loads when a fuse has blown. It also has a mechanical interlock to prevent inadvertent switching until fuses have been installed or blown fuses have been replaced.

The HVL/cc enclosure is designed for front access only and can be positioned against walls, in small rooms or in pre-fabricated buildings. The small footprint can result in considerable cost savings from the reduction of building or room sizes.

HVL/cc Load Interrupter Switches—Full Range 600/1200 Ampere Ratings

Switchgear Standard Features

- Tin plated copper bus for lineups
- Cable lugs included for one cable per phase
- Live line indicators on all incoming switch bays and outgoing feeder circuits
- UL/CUL Listed
- Top or bottom cable entry
- Padlocking open or closed provision
- Animated mechanism mimic bus
- Front access only
- Fuse/cable access panel interlocked with switch
- Epoxy insulators
- 11 gauge steel enclosure
- Compartments: Switch, bus, fuse/cable, mechanism, main bus compartment

Surge Arresters

- System L/L Voltage kV
- Arrester MCOV kV
- Nominal Maximum
- Effectiveness Impedance Balanced Unbalanced
- Impedance Grounded Ungrounded

Switchgear Options

- Internal ground switch: Has full fault making capability
- Fuselogic™ system
- Infrared viewing windows
- Class I, Division 2
- Fast auto transfers
- Duplex configurations
- Protective relaying
- Powerlogic® metering
- 20-inch or 29.5-inch wide enclosures

Fuselogic™

Fuselogic is a protection system that provides the ultimate in medium voltage fuse protection. This patented system utilizes the Square D® current-limiting fuses with mechanical sensors that function without any auxiliary power requirements. Several combinations of Fuselogic functions can be combined to provide simple blown fuse indication contacts with mechanical lockout to anti-single phasing protection. Anti-single phasing requires the optional stored energy mechanism (SEM). Fuselogic is available on both HVL/cc and HVL switches.

Switchgear Standard Features

- Compartments: Switch, bus, fuse/cable, mechanism, and optional low voltage/control
- 11 gauge steel enclosure
- Epoxy isolators
- Fuse/cable access panel interlocked with switch
- Front access only
- Animated mechanism mimic bus
- Padlocking open or closed provision
- Top or bottom cable entry
- UL/CUL Listed
- Live line indicators on all incoming switch bays and outgoing feeder circuits
- Cable lugs included for one cable per phase
- Tin-plated copper bus for lineups

Surge Arresters
HVL/cc Switchgear—Quick Ship Program—5–15 kV, 600 Amperes

The HVL/cc quick ship program provides basic fused and unfused load interrupter switch configurations for stand-alone or transformer primary applications. The Quick Ship program offers faster delivery, but with fewer options. Three-pole, 600 ampere individual HVL/cc switches are available in free-standing indoor (NEMA 1) enclosures. These switches are available unfused or with provisions for Square D® current-limiting DIN/E fuses. Factory optional accessories include auxiliary bays, main bus, auxiliary switches, extra cable terminating lugs, and distribution class surge arresters. The fuse access panel is mechanically interlocked with the switch mechanism. Key interlocks are not an available option with Digest-listed HVL/cc switches. (1) Set screw lug for (2) 40–350 kcmil copper or aluminum cables are provided for line and load connections. Fuses are not furnished with this equipment. For fuse information and pricing refer to page DE12-5.

Provisions for Future Expansion

All “single” HVL/cc switches have provisions for future expansion on either side. Order main bus kits for copper 600 ampere bus. Include sketch for factory-assembled parts or lineups.

600 Ampere Single Switch Unfused

Manual over-toggle mechanism, no grounding switch

600 Ampere Single Switch Fused

(Provisions only for Square D® current-limiting DIN/E fuses—order fuses separately) Manual over-toggle mechanism, no grounding switch

600 Ampere incoming Line Auxiliary Bay

For bottom incoming cable to application A (bottom cable exit) switch(es)

Order 600 ampere tin plated Cu main bus to adjacent section from bus table

Includes (1) set screw lug for (2) 40–350 kcmil Cu or Al conductor per phase

Order 600 ampere tin plated Cu main bus to adjacent section from main bus table

Includes (1) set screw lug for (2) 40–350 kcmil Cu or Al conductor per phase

HVLcc Switchgear

Class 6045 / Refer to Catalogue 6045CT9801

Medium Voltage Metal-Enclosed —HVL/cc™ Switchgear

HVLCCA20A 4.76/15 —B 20.00 508

HVLCCA14A 4.76/15 —A 14.75 375

HVLCCA14A14 B 14.75 375 A 14.75 375

HVLCCA20A20 A 20.00 508 A 20.00 508

HVLCCA20A14 A 20.00 508 A 14.75 375

HVLCCA14A14 A 14.75 375 A 14.75 375

HVLCCMBB20A20 B 20.00 508 A 20.00 508

HVLCCMBB14A20 B 14.75 375 A 20.00 508

HVLCCMBB14A14 B 14.75 375 A 14.75 375

HVLCCMBB20B14 B 20.00 508 B 14.75 375

HVLCCMBB14B20 B 14.75 375 B 20.00 508

HVLCCMBB14B14 B 14.75 375 B 14.75 375

HVLCCMBA20B14 A 20.00 508 B 14.75 375

HVLCCMBA14B20 A 14.75 375 B 20.00 508

HVLCCMBA14B14 A 14.75 375 B 14.75 375

HVLCCMBA20A20 A 20.00 508 A 20.00 508

HVLCCMBA20A14 A 20.00 508 A 14.75 375

HVLCCMBA14A14 A 14.75 375 A 14.75 375

HVLCCDSA10 10 kV, 8.40 kV MCOV 14.75 375

HVLCCDSA18 18 kV, 15.3 kV MCOV 20.00 508

HVLCCDSA12 12 kV, 10.20 kV MCOV 14.75 375

HVLCCDSA6 6 kV, 5.10 kV MCOV 14.75 375

HVLCCDSA9 9 kV, 7.65 kV MCOV 14.75 375

Distribution Class Surge Arresters

(One Set of Three) Switch Load Side Connected or
Incorporating Line Bay

Catalogue No. Description

<table>
<thead>
<tr>
<th>Catalogue No.</th>
<th>UL (Ratings per Catalogue No. 6045C-0488 and 6045C-0558)</th>
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<tr>
<td>HVLDCB32X</td>
<td>16 kV, 17.5 kV MCOV, 15.75 kV MCOV</td>
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<td>HVLDCB32Y</td>
<td>16 kV, 17.5 kV MCOV, 15.75 kV MCOV</td>
</tr>
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<td>HVLDCB40A</td>
<td>20 kV, 23.0 kV MCOV, 21.0 kV MCOV</td>
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<tr>
<td>HVLDCB40B</td>
<td>20 kV, 23.0 kV MCOV, 21.0 kV MCOV</td>
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600 Ampere Tin Plated Copper Main Bus Kits

Catalogue No. Description

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<th>Catalogue No.</th>
<th>UL Ultrasound (Ratings per Catalogue No. 6045C-0488 and 6045C-0558)</th>
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Factory Modifications

Catalogue No. Description

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<td>14.75 375 A 14.75 375</td>
</tr>
</tbody>
</table>

UL Listed metal-enclosed
Interrupter switchgear

NOTE: Mechanical interlock between switch and fuse access panel.

NOTE: Mechanical interlock is standard on switches.

600 Ampere incoming Line Auxiliary Bay

Order 600 ampere tin plated Cu main bus to adjacent section from bus table

Includes (1) set screw lug for (2) 40–350 kcmil Cu or Al conductor per phase

For top incoming cable to application B (top cable exit) switch(es)

Order 600 ampere tin plated Cu main bus to adjacent section from main bus table

Includes (1) set screw lug for (2) 40–350 kcmil Cu or Al conductor per phase

600 Ampere incoming Line Auxiliary Bay

For bottom incoming cable to application A (bottom cable exit) switch(es)
Listed metal-enclosed interrupter switchgear

Power-Cast® and Uni-Cast® Transformers

Only for Square D® Current-Limiting Non-Disconnect Type Fuses for Cable Connection to Power-Ory™, Power-Cast™ and Uni-Cast™ Transformers

(FLC = 300 Amps MAXIMUM)

RM—Transformer on right, LH—Transformer on Left

Application B = Bottom Entry (Incoming Cables)

Application A = Top Entry (Incoming Cables)

(FLC = 300 Ampere MAXIMUM)

Interlock to Prevent Paralleling of Sources

Application A = Top Entry (Incoming Cables)

Application B = Bottom Entry (Incoming Cables)

Rating

Class 6045 / Refer to Catalogue 6045CT9801

Medium Voltage Metal-Enclosed—HVL/cc™

Switchgear

General Purpose E-Rated Current-Limiting Fuses: Type DIN/E for HVL/cc Switches

Integrated rating for 600 ampere HVL/cc switches with Square D® DIN/E fuses listed below is 65 kA rms symmetrical amperes. (50 kA rms for 630 ampere fuse.)

Current-limiting fuses increase the integrated short-circuit symmetrical amperes. (50 kA rms for 630 ampere fuse.)

To increase the short-circuit current rating of the entire lineup of switchgear, current-limiting fuses must be used in the entrance sections.

Ordering Information

1. Select switch catalog number based on fused or unfused and cable entry locations (top or bottom) from table on page DE12-4.

2. Select incoming line auxiliary bay from table on page DE12-7, if required.

3. Select main bus from table on page DE12-4, if required.

4. Select catalog numbers for factory modifications from table on page DE12-4, if required.

5. If fused, select DIN/E fuses.

55DE010 5.5 10E 1 Actual 14.75 375

55DE015 5.5 15E 1 Actual 14.75 375

55DE020 5.5 20E 1 Actual 14.75 375

55DE030 5.5 30E 1 Actual 14.75 375

55DE040 5.5 40E 1 Actual 14.75 375

55DE050 5.5 50E 1 Actual 14.75 375

55DE065 5.5 65E 1 Actual 14.75 375

55DE080 5.5 80E 1 Actual 14.75 375

55DE100 5.5 100E 1 Actual 14.75 375

55DE125 5.5 125E 1 Actual 14.75 375

55DE150 5.5 150E 1 Actual 14.75 375

55DE200 5.5 200E 1 Actual 14.75 375

55DE250 5.5 250E 1 Actual 14.75 375

55DE300 5.5 300E 1 Actual 14.75 375

55DE350 5.5 350E 1 Actual 14.75 375

55DE400 5.5 400E 1 Actual 14.75 375

55DE450 5.5 450E 1 Actual 14.75 375

55DE600 5.5 620A 2 350 20.00 508

Catalogue

1. Select switch catalog number based on fused or unfused and cable entry locations (top or bottom) from table on page DE12-4.

2. Select incoming line auxiliary bay from table on page DE12-7, if required.

3. Select main bus from table on page DE12-4, if required.

4. Select catalog numbers for factory modifications from table on page DE12-4, if required.

5. If fused, select DIN/E fuses.

55DE010 5.5 10E 1 Actual 14.75 375

55DE015 5.5 15E 1 Actual 14.75 375

55DE020 5.5 20E 1 Actual 14.75 375

55DE030 5.5 30E 1 Actual 14.75 375

55DE040 5.5 40E 1 Actual 14.75 375

55DE050 5.5 50E 1 Actual 14.75 375

55DE065 5.5 65E 1 Actual 14.75 375

55DE080 5.5 80E 1 Actual 14.75 375

55DE100 5.5 100E 1 Actual 14.75 375

55DE125 5.5 125E 1 Actual 14.75 375

55DE150 5.5 150E 1 Actual 14.75 375

55DE200 5.5 200E 1 Actual 14.75 375

55DE250 5.5 250E 1 Actual 14.75 375

55DE300 5.5 300E 1 Actual 14.75 375

55DE350 5.5 350E 1 Actual 14.75 375

55DE400 5.5 400E 1 Actual 14.75 375

55DE450 5.5 450E 1 Actual 14.75 375

55DE600 5.5 620A 2 350 20.00 508

Ordering Information

1. Select switch catalog number based on fused or unfused and cable entry locations (top or bottom) from table on page DE12-4.

2. Select incoming line auxiliary bay from table on page DE12-7, if required.

3. Select main bus from table on page DE12-4, if required.

4. Select catalog numbers for factory modifications from table on page DE12-4, if required.

5. If fused, select DIN/E fuses.
**Switchgear**

**Medium Voltage Metal-Enclosed—HVL**

Class 6040 / Refer to Catalogue 6040CT9201 or Handout

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**HVL-Metal-Enclosed Load Interrupter Switchgear—Full Range**

HVL Metal-Enclosed Load Interrupter Switchgear 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 hub-and-substation environment — 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.

HVL switchgear is available for various applications and configurations, including:

- Individual service entrance bays
- Multiple-bay lineups incorporating HVL load interrupters and optional Visi/Vac® circuit interrupters
- Substation primaries

Square D™ metal-enclosed switchgear has become an industry standard for its better system performance, lower maintenance cost, easier system expansion, and reduced system expenses. A full range of ratings and options is available but not listed in this publication. Contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

**Standard Features**

- 11 gauge steel enclosure
- Direct drive mechanism
- Permanently attached operating handle
- Visible isolation viewing window
- Mechanical interlocked fuse access door
- Provision for padlock and key interlock
- Highly flexible design
- ANSI 81 paint

**Options**

- Outdoor construction
- Square D™ DIN-style current-limiting fuses
- Boric acid fuses
- Silver or tin-plated copper bus
- 600, 1200 or 2000 ampere main bus
- Heat shrink insulated bus
- Motor operator
- Ground handle
- Fuselogic™ tripping system
- Automatic load transfer schemes
- Disconnect switches
- Key interlocks
- Surge arresters

- Utility metering bays
- Line selector switch
- Duplex switch
- Transformer connections
- Infrared windows for thermal scanning of connections

**Fuselogic™**

Fuselogic is a protection system that provides the ultimate in medium voltage fuse protection. This patented system utilizes the Square D™ current-limiting fuses with mechanical sensors that function without any auxiliary power requirements. Several combinations of Fuselogic functions can be combined to provide simple blown fuse indication contacts with mechanical lockout to anti-single phase protection. Anti-single phase requires the optional stored energy mechanism (SEM). Fuselogic is available on both HVL/SC™ and HVL switchgear.

**HVL Switchgear—Quick Ship Program—5 kV–15 kV, 600 Ampere Features**

The HVL quick ship program provides basic fused and unfused load interrupter switch configurations for stand-alone or transformer primary applications. The Quick Ship program offers faster delivery, but with fewer options.

Three-pole, 600 ampere individual HVL switches are available in free-standing indoor (NEMA 1) or outdoor (NEMA 3R) enclosures. The switches used in these enclosures are UL Recognized and are listed under Category IQ 2 In Flx E1 051/M. These switches are available unfused or with provisions for 3-inch diameter Square D™ current-limiting fuses or for boron acid fuses. Factory optional accessories include auxiliary switches, extra cable terminating lugs and distribution class surge arresters. The door is mechanically interlocked with the switch operating handle and provisions for key interlocks are standard. Set screw type lugs for one 3/0 or 600 kcmil copper or aluminum conductors are provided for line and load connections. Other standard features include a bolted enclosure with a viewing window, ground pad, and auxiliary lugs. Connections for up to 3/0 conductors in the feeder must be from external source. Fuselocks are not furnished with this equipment. For fuse information, refer to page DE12-8. Switches are featured on pages DE12-6–DE12-7, and many of the fuse configurations for Square D Current-Limiting and 600 Ampere “Single” Switch Unfused are listed on page DE12-9 are available from stock.

---

**Standard Features**

- 11 gauge steel enclosure
- Direct drive mechanism
- Permanently attached operating handle
- Visible isolation viewing window
- Mechanical interlocked fuse access door
- Provision for padlock and key interlock
- Highly flexible design
- ANSI 81 paint

**Options**

- Outdoor construction
- Square D™ DIN-style current-limiting fuses
- Boric acid fuses
- Silver or tin-plated copper bus
- 600, 1200 or 2000 ampere main bus
- Heat shrink insulated bus
- Motor operator
- Ground handle
- Fuselogic™ tripping system
- Automatic load transfer schemes
- Disconnect switches
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**HVL Switchgear—Quick Ship Program—5 kV–15 kV, 600 Ampere Features**

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---

**Standard Features**

- 11 gauge steel enclosure
- Direct drive mechanism
- Permanently attached operating handle
- Visible isolation viewing window
- Mechanical interlocked fuse access door
- Provision for padlock and key interlock
- Highly flexible design
- ANSI 81 paint

**Options**

- Outdoor construction
- Square D™ DIN-style current-limiting fuses
- Boric acid fuses
- Silver or tin-plated copper bus
- 600, 1200 or 2000 ampere main bus
- Heat shrink insulated bus
- Motor operator
- Ground handle
- Fuselogic™ tripping system
- Automatic load transfer schemes
- Disconnect switches
- Key interlocks
- Surge arresters

- Utility metering bays
- Line selector switch
- Duplex switch
- Transformer connections
- Infrared windows for thermal scanning of connections

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The HVL quick ship program provides basic fused and unfused load interrupter switch configurations for stand-alone or transformer primary applications. The Quick Ship program offers faster delivery, but with fewer options.

Three-pole, 600 ampere individual HVL switches are available in free-standing indoor (NEMA 1) or outdoor (NEMA 3R) enclosures. The switches used in these enclosures are UL Recognized and are listed under Category IQ 2 In Flx E1 051/M. These switches are available unfused or with provisions for 3-inch diameter Square D™ current-limiting fuses or for boron acid fuses. Factory optional accessories include auxiliary switches, extra cable terminating lugs and distribution class surge arresters. The door is mechanically interlocked with the switch operating handle and provisions for key interlocks are standard. Set screw type lugs for one 3/0 or 600 kcmil copper or aluminum conductors are provided for line and load connections. Other standard features include a bolted enclosure with a viewing window, ground pad, and auxiliary lugs. Connections for up to 3/0 conductors in the feeder must be from external source. Fuselocks are not furnished with this equipment. For fuse information, refer to page DE12-8. Switches are featured on pages DE12-6–DE12-7, and many of the fuse configurations for Square D Current-Limiting and 600 Ampere “Single” Switch Unfused are listed on page DE12-9 are available from stock.
Switchgear

Switchgear DE12

DE12-10

Provisions for Future Expansion

All "single" Digest switches have provisions for future expansion on either side. Orders for top crossover copper 600 ampere bus and HVLC for line connections to the top bus. (Refer to the Factory Modifications table on page DE12-8.) Include sketch for factory-assembled parts or lineups.

Includes fuse holder only. See table on page DE12-9 for fuse refills.

Note: Switches with transformer connections are painted ANSI 49. Standalone switches are painted ANSI 61.

Ratings

Max. Design Voltage (kV) 4.76 15.0
BIL (kV) 60 95
Frequency (Hz) 50/60 50/60
Continuous amperes 600 600
Interrupting amperes 600 600

600 Ampere “Single” Switch with PROVISIONS ONLY for Square D

600 A “Duplex” Switch with PROVISIONS

Class 6040 / Refer to Catalogue 6040CT9201 or Brochure 6040BR9401

Distribution Class Surge Arresters

System L-L Voltage (kV) Arrester MCOV-kV

Normal

3.0
4.16
4.8
6.9
12.0

Grounded

Neutral Circuits

Impedance Grounded

and Ungrounded

Circuits

2.54
4.4
5.08
7.26
12.70

600 Ampere “Single” Switch with PROVISIONS ONLY for Square D

Current-Limiting Non-Disconnect Type

Fuses for Cable Connection to Power-Dry,
Power-Cast and Uni-Cast Transformers

(RFLC = 300 Ampere MAXIMUM)

RH—Transformer on Right, LH—Transformer on Left

Included fuse holder only. See back of page DE12-9 for fuse refills.

Note: Switches and transformer connections are painted ANSI 61. Standalone switches are painted ANSI 61.
Switchgear

Medium Voltage Metal-Enclosed—HVL
Class 6040 / Refer to Catalogue 6040CT9201

Fuse Selection
The rule of thumb method for selecting fuses for transformer protection is 1.33 times the self-cooled full load current of the transformer or the next higher fuse rating. Selection of the fuse is the customer’s responsibility and should be based on transformer and system characteristics.

- **Maximum Fuse Size:**
  - Maximum fuse size should be determined by comparing the fuse total clearing curve to the transformer damage curve. Contact Schneider Electric for transformer overload and short-circuit withstand capability.
  - Minimum Fuse Size:
  - Minimum fuse size shall carry the transformer magnetizing inrush current of 12 times full load amperes for 0.1 second.

Factory Modifications

<table>
<thead>
<tr>
<th>Catalogue No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HVMB</td>
<td>Main fuse kit, 600 ampere copper</td>
</tr>
<tr>
<td>HVLC</td>
<td>Low side connection kit (shell base 600 amperes with 3-1/0-500 MCM lugs (top only))</td>
</tr>
<tr>
<td>HVLC2</td>
<td>Set screw type lugs 1/0—500 kcmil (qty. 3)</td>
</tr>
</tbody>
</table>

Standard Features

- Switches for transformer primaries are cable connected only.
- Key interlocks must be ordered and coordinated by customer.
- Standard color is ANSI 61 for stand alone units; ANSI 49 for switches connecting to transformers.
- ANSI 49 for switches connecting to transformers.
- If switches are purchased to coordinate with Square D® transformers, composite drawings and shipment coordination will not be available.
- Switches are not designed for any special dimensions for retrofit purposes. For dimensions other than shown, contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

Ordering Information

1. Select switch catalog number based on fused or unfused and enclosure type.
2. Select catalog numbers for factory modifications from the table above.
3. If fused, select fuse from table on page DE12-9.
4. Price switch and fuses separately. Switches are furnished with provisions only for current-limiting fuse or boric acid fuse.
Switchgear

Switchgear DE1

DE1-11

Square D® DIN/E Fuse Selection Tables—HVL

▲ Square D® DIN/E fuses are shown in this table. For fuses produced by other manufacturers, contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

■ All fuses are single barrel arrangement with ferrule diameters per the chart.

◆ Current-limiting fuses will increase the integrated short-circuit ratings beyond the non-fusible units. Contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

Square D® DIN/E fuses are shown in this table. For fuses produced by other manufacturers, contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

■ All fuses are single barrel arrangement with ferrule diameters per the chart.

◆ Current-limiting fuses will increase the integrated short-circuit ratings beyond the non-fusible units. Contact your nearest Schneider Electric sales office or your local Schneider Electric distributor.

Current-Limiting Fuses Non-Disconnecting Type

▲◆ (Extended travel blown fuse indicator)

(Contact your nearest Schneider Electric sales office for current stock quantities.) One Set of Three Packed in One Box.

Continuous Current

Fuse Mounting Clips

Catalogue No.

Centres (in)

Diameter (mm)

Fuse Selection Tables Boric Acid Fuses—HVL

▼ S&C Boric Acid Fuses

Type SM-5S fuses are manufactured by the S&C Electric Company. SM-5S has a 25.0 kA symmetrical short-circuit rating from 2.4 kV to 17.0 kV. For 16.5 kV ratings, only S&C boric acid fuses can be used.

˚ Cutler-Hammer - Westinghouse Fuses

Type RBA-400 fuses are manufactured by Cutler-Hammer - EATON Corporation. RBA-400 has a 37.5 kA symmetrical ampere short-circuit rating from 2.4 kV to 4.8 kV and 29.4 kA symmetrical from 12 kV to 13.8 kV.

DIN/E Current-Limiting Fuses Non-Disconnecting Type

▲◆ (Extended travel blown fuse indicator)

(Contact your nearest Schneider Electric sales office for current stock quantities.) One Set of Three Packed in One Box.

Continuous Current

Fuse Mounting Clip

Catalogue No.

Centres (in)

Diameter (mm)

New!

Vendor Product Number

Catalogue No.

Fuse Type

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

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Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.

Vendor Product Number

Catalogue No.
Masterclad® Medium Voltage Metalclad™ Switchgear (UL Listed)

The Reliability of a Quality Design

The quality of Square D® Masterclad medium voltage Metalclad switchgear stems from a design and manufacturing process that focuses on long-term switchgear performance with the highest degree of reliability.

Based on specific customer application needs, Schneider Electric engineers and technicians select the appropriate standard sections and bus configurations, with the ability to customize where needed. After the specified circuit breakers, instrument and control power transformers, relays, meters and other components are selected and approved. All are factory-assembled, wired, and tested as a complete assembly.

Type VR Vacuum Circuit Breaker

The VR breaker is a horizontal drawout type designed to provide long life, reduced maintenance, and ease of handling. The Type RI advanced design motor-charged stored energy mechanism is a model of reliability with simplicity—with an operating life exceeding ANSI requirements. The VR circuit breaker is UL labeled and includes a permanently mounted manual charging handle.

Switchgear Construction

- Floor mounted breaker racking mechanism
- Standard epoxy supports or optional porcelain supports
- Aluminum or copper main bus
- Indoor NEMA 1
- Outdoor NEMA 3R
- Walk-in
- Non walk-in

Arc Terminator™ Arc Extinguishing System

Active system detects and controls the effects of internal arcing faults. It complies with ANSI C37.20.7 requirements for arc resistant switchgear for Type 1, Type 2, and Type 2A.

Benefits

- Prevents pressure buildup
- Reduces release of toxic materials
- Eliminates need for reinforced switchgear
- Eliminates special requirements for buildings or plenums
- Minimizes equipment damage
- Reduces operating downtime

SF₆ Circuit Breakers

The LF and SF Series of SF₆ Medium Voltage circuit breakers are available for the following ratings

- Rated Voltage: 5 to 38 kV
- Rated Current: 600 to 3000 A
- Insulation Level: up to 200 kV
- Standards: ANSI and IEC

Please contact Marketing for further information.
Motorpact™ Medium Voltage Motor Controllers (UL Listed)

Square D® Motorpact medium voltage motor controllers are designed and manufactured to tackle the toughest power and process control challenges. Our motor controllers feature industry-first innovations that provide unmatched performance, high reliability, low maintenance and exclusive technologies. Motorpact medium voltage motor controllers are designed to provide the most efficient means to control and protect a wide range of applications and may be configured for motor starting, transformer feeders, capacitor feeders or future spaces.

Motorpact controllers are designed to meet or exceed the standards for NEMA ICS3 Part 2, UL Standard 347, and IEC 60470. UL and cULus labels are standard.

Starting application for squirrel cage induction motors:
• Full voltage non-reversing
• Full voltage reversing
• Reduced voltage non-reversing — Auto transformers
  — Solid state soft start

Enclosures are available in Type 1, 1A, and 3R and feature the smallest footprint in the industry at 14.75 inches wide. Enclosures that are 20-inches and 29.5-inches wide are also available for FVNR.

Optional arc resistant Type 2 enclosures are also available.

Units are designed as one-high construction for ease of use with a optimum height for the operator controls and isolation switch disconnect handle.

Full front and or front and rear accessibility are provided. A full height cable pulling area is standard.

Controller voltage ratings range from 2.3–7.2 kV vacuum contactors feature a drawout design and have ratings of 200, 400, 450, and 720 amperes.

Options include live line indicators, blown fuse tripping, solid state protective relays, power factor correction capacitors, surge arresters, surge capacitors and a cable grounding switch.

Powersub® Vacuum Substation Circuit Breaker Type FVR
(Not UL Listed)

By combining the latest developments in circuit breaker technology with world-renowned quality, Powersub vacuum substation circuit breakers are the most advanced medium voltage circuit breakers available. The Type FVR Powersub circuit breakers include arc-resistant construction and are built to comply with ANSI standards.

Features and Ratings
• Voltage—15–38 kV
• 110–200 kV BIL
• Ampere Ratings—600, 800, 1200, 2000, 3000, 5000 and 4000
• Interrupting amperes—12.5–40 kA (rms symmetrical)
• Arc resistant enclosure construction, 2000 amperes and below, based on EEMAC and IEC test standards
• No fans required for 3000 ampere ratings
• Interrupting time of three (3) cycles
• Hermetically sealed vacuum interrupters

The arc-resistant design takes safety to the next level. In the event of an arc, the arc-resistant construction provides increased safety for personnel working in proximity of the breaker by venting resultant arc by-products and ionized gases upward and away from exterior panels that otherwise may not remain intact and in place. The Powersub circuit breakers also provide superior protection as a result of their high speed operation. You can expect long life from the product as the vacuum interrupter contacts are protected from corroding elements and contamination.
Switchgear

Load Break Interrupter Switches - Refer to Document C-3-512

Load Interrupter Switches 4.16 through 34.5 kV

For cost efficiency and versatility select an FPL Type NAL load break switch. It can be provided with numerous options including motor driven operating mechanism.

For further information refer to Bulletin No. C-3-512.

The type NAL 3 pole, load interrupter switch is suitable for use as a main or feeder load interrupter switch or as a primary protective device when fitted with fuses.

The type NAL switch can be used in conjunction with current-limiting fuses or expulsion type power fuses.

The NAL switch is available with either a quick make, quick break mechanism, or with the same characteristics and a spring stored energy mechanism which allows the switch to be tripped remotely or used in conjunction with protective relays. The switch can also be automatically tripped after operation of a striker-pin equipped fuse to prevent single phasing. Optional features include motor operators for all types of operating mechanisms, blown fuse single phase protection, and mechanically interlocked grounding switch, Type EB.

<table>
<thead>
<tr>
<th>Type</th>
<th>NAL 5</th>
<th>NAL 7</th>
<th>NAL 15</th>
<th>NAL 15.5</th>
<th>NAL 25</th>
<th>NAL 35</th>
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<td>Nominal Voltage Rating kV</td>
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<td>Maximum Rated Voltage kV</td>
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<td>13.0</td>
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<td>38.0</td>
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<td>600, 1000</td>
<td>600, 1000</td>
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<td>Impulse Test Voltage (kV)</td>
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<td>75</td>
<td>95</td>
<td>110</td>
<td>120</td>
<td>150</td>
</tr>
</tbody>
</table>

Type NAL 3 Pole Load Interrupter Switch