

The complete guide to Low Voltage switchgear



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The complete guide to low voltage switchgear

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Introduction

A complete range of LV switchgear from the transformer to the metering point.

Whatever your requirement for LV distribution, we have the solution from fuse protection to the latest circuit breaker technology. The assembly can be custom built to meet your needs and delivered direct to site whilst maintaining short product lead times from the moment you place the order.

When indoor space is at a premium, the answer is often outdoors.

Merlin Gerin LV switchgear can be installed outdoors or indoors, in a public or private network to protect and distribute electricity to housing estates, shopping centres, colleges, ports, airports, MoD Estates, telecommunication sites, factories and many other commercial and industrial installations.

One of the great advantages of the Merlin Gerin outdoor distribution range, apart from the fact that they cost much less than a purpose built brick or fibreglass substation and indoor switchboard, is their much smaller size. Outdoor low voltage switchgear can often be sited closer to the load, cutting installation and running costs.

In addition, when it comes to safety, Merlin Gerin feeder pillars are second to none. Safety as a minimum is to IPXXB standards, this means that even an operator is protected from potentially live conductors during normal service conditions.



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Used individually or as an integrated part of an MV/LV package substation, low voltage switchgear is the distribution solution that provides the lowest total cost of ownership for many sites.

Introduction

Safe, flexible and much more.

Easy and safe to use

Merlin Gerin LV switchgear assemblies are designed with inherent safety, which means they can be operated by less skilled personnel and ultimately reduce expensive training costs.

Saving valuable indoor floor space

On many sites, such as retail outlets and hospitals, indoor floor space is at a premium and its loss to an indoor switchroom is unacceptable. Outdoor LV switchgear simply side steps this issue.

Reduces cabling

Requiring no external housing, outdoor feeder pillars are compact in footprint size and can be installed closer to the point of demand. This reduces substantially the length of cable runs and sizes required, which is often a dominant cost during installation. The associated level of expensive circuit protection can also be lower. As an added benefit for the end user, operational costs are cut because shorter cables mean lower losses.

High availability for low ownership costs

Monitoring and control systems are easily integrated with Merlin Gerin LV switchgear. The ability to monitor and control low voltage systems remotely can greatly boost utilisation of the assembly by enabling the network to be reconfigured to minimise costly supply failures. Remote monitoring is also a tremendous aid to energy management schemes.

Meets future requirements

Merlin Gerin LV switchgear is designed with future needs in mind. Assemblies can be specified with capacity to spare. New circuits can be readily added at any time to allow the installation to expand as demand grows. Monitoring and control options can also be easily retrofitted, which all means you make the best use of your available capital, while protecting your investment for many years to come.

Long life, low maintenance

Merlin Gerin LV switchgear for outdoor use is manufactured from 3mm hot-dip galvanised steel, processed with a primary coat of zinc rich epoxy powder paint and finished with a final coat of polyester powder paint that is cured to produce a hard wearing gloss finish.

All of which makes the robust enclosure, vandal proof and weatherproof for reliable operation in all environmental conditions.





SAIF - Switched And Insulated Fusegear

Indoor/outdoor LV distribution up to 3200A



Merlin Gerin's Switched And Insulated Fusegear (SAIF) is the world's safest feeder pillar range. Fully type-tested it provides IPXXB operator protection in all operating conditions, even when fuse links are being replaced with the pillar remaining live.

Fault make and load break switching can be safely performed by less experienced operators, thanks to its ASTA-certified switching. The switching utilises the fully transferable independent manual switching mechanism, which, to ensure safety, is the only way that the fuse carrier can be switched 'on' or 'off'. A fully interlocked design ensures correct operation and switching does not depend on the skill of the operator, or the speed with which the handle is turned.

SAIF is factory assembled in a choice of outdoor feeder pillar, fuse cabinet or indoor fuseboard providing safe solutions for LV distribution, with the added benefit of minimum maintenance.

SAIF's unique qualities have proved successful in markets around the world, being extensively used by utilities, commercial and industrial customers.



Features and benefits

- Assured fault make, load break switching capability independent of the skill or speed of the operator
- Fuse switch performance to AC22B of IEC 60947-3
- Fully interlocked fuseway with switching mechanism ensures safe operation
- Operator protection to IPXXB of IEC 60529 even with the fuse carriers removed from the outgoing fuseway
- Cable terminations at the base of fuseway accept cables up to 1 x 4C300mm² per circuit up to 630A
- Simple 'Plug-on' fuseway design allows for easy addition of new circuits whilst reducing initial capital cost of the assembly
- Test probe access through front of fuse carrier
- Accepts type gU fuse links with wedge tightening contacts 82mm or 92mm centres
- Three ratings of outgoing fuseway from 400A, 630A and 800A

Busbar ratings
up to 3200A



IPXXB Operator
protection



Outdoor &
indoor solutions



Independent manual
switching



SAIF - Heavy duty cut-out range

Indoor LV protection and isolation up to 630A



The innovative range of SAIF cut-outs provide circuit protection and a certified switching capability with inherent safety features normally associated with fuse switches whilst retaining the complete flexibility of a traditional cut out.

The high level of enclosure protection to IP41 permits flexibility in site location, including areas accessible to the general public. The SAIF range of cut outs provides IPXXB operator protection, preventing accidental contact with live conductors during switching and fuse link replacement with the cut out still live.

Individual fully insulated phase and neutral modules in a horizontal TP&N arrangement which, should a fault occur, prevent failure across adjacent units. Assembled together on two individual plattens, the complete unit can be easily installed through four external bolt fixings that also allow for the simple installation of the fully insulated cable box.



A portable independent manual switching mechanism provides a proven fault making, load breaking switching capability, independent of the operators skill and dexterity. The cut out, fuse carriers and switching mechanism are interlocked ensuring correct operation even by inexperienced operators.

The fully insulated design eliminates the need for direct earthing of the cut out enclosure therefore facilitating flexibility in system earthing. Flexible cabling arrangements allow for ring or radial systems, single or multi-core cables, aluminium or copper conductors.

Features and benefits

- Fully insulated design removes need for direct earthing
- Full segregation between phases and neutrals
- IP41 allows for flexibility of installation location
- IPXXB operator protection from live conductors - even when changing fuselinks
- Fully interlocked design for correct operation
- Independent manual switching mechanism - certified fault make, load break switching

400A and 630A ratings



Independent manual switching



Fully interlocked



IP41 rated enclosure



Shielded fusegear

Indoor/outdoor LV distribution up to 3200A



The Shielded range from Merlin Gerin, comprises of fuse cabinets, fuseboards and feeder pillars and goes one step further than traditional exposed live copperwork by screening all live conductors during normal service conditions. Thus Shielded fusegear ensures safety for all entering a substation from accidental contact with live parts and greatly reducing the risk of an electric shock.

The fuseway design fully segregates the main busbars and each outgoing circuit. Individual moulded phase shrouds provide easy access to cable terminations whilst ensuring protection from the adjacent live circuits.

Ease of operation, Shielded fusegear holds the solution

Fuse carriers accept gU type fuselinks with wedge tightening contact whilst the patented through-grip handle ensures easy manual making and breaking of contacts. The fuse carrier design also requires no tools to change the fuse link and the ergonomic design of the thumbscrew lozenge ensures tight fuse link contacts in order to prevent overheating and potential interruptions of the supply.





The shielded fuseway contacts and removable shrouds allow easy 'hinge in' and 'snatch out' manual switching actions. Solid plastic busbar contact shrouds are provided to maintain operator protection to IPXXB once the fuse handle has been removed.

Outgoing cables up to 300mm² terminate directly to the fixed fuse link contacts with a four position terminal arrangement eliminates phase cable core cross-overs.

Features and benefits

- Fuseway ratings of 400A, 630 and 800A
- Fuse carrier accepts type gU fuselinks with wedge tightening contacts 82mm or 92mm centres
- Operator protection to IPXXB in normal service conditions
- Through grip fuse handle for ease of manual switching
- Fuse carrier requires no tools to change a fuselink
- Fully segregated busbars and circuits with removable solid phase shrouds
- Test probe access to busbar and outgoing circuit whilst maintaining IPXXB
- Segregated circuits allows for safe cabling with adjacent fuseway live*
- Four position terminals ensure no phase core cross-overs
- Freestanding or TX mounted solutions

Busbar ratings
up to 3200A



IPXXB Operator
protection



Outdoor &
indoor solutions



Test probe
access



*All work on equipment that may be live must be carried out in complete compliance with the electricity at work regulations and all safety procedures must be observed.

Shielded heavy duty cut-out

Indoor LV protection and isolation up to 630A



The Merlin Gerin Shielded heavy duty cut-out goes one step further than traditional cut-outs. It gives operator protection to IPXXB by using proven Shielded fusegear technology.

Shielded heavy duty cut-out provides operator protection to IPXXB from live conductors as the cut-out incorporates segregated, flame retardant phase termination mouldings and a 'through grip' fuse handle on each fuse carrier.

Phase termination modules are individually segregated making it easy to remove and have access to either the top and bottom cable terminations.

It is possible to make a circuit live in seconds, as the Shielded fuse carriers dispense with the need for tools to change the fuselink. The unit can easily be fitted in areas used by the general public as it conforms to IP4X.

Especially designed for commercial and industrial building applications, customers' individual requirements can be accommodated by the use of additional accessories.



Features and benefits

- Available in 400A and 600A ratings
- Conforms to ENA-TS 37-2, IEC 60947-3, IEC 60439-1, IEC 60529 standards
- IPXXB operator protection during normal operation and IP4X in normal service
- 8 segmented phase termination modules on a common one-piece insulated base moulding
- Through grip shielded fuse handles on all fuse carriers
- Easy access to both top and bottom cable termination
- Compact, modular design
- Wide range of termination solutions

400A & 630A ratings



IPXXB Operator protection



Fully segregated design



Toolless fuse carrier



NS Feeder Pillar

Outdoor switchboard solution with ratings up to 3200A



The NS range of outdoor switchboards incorporates technically advanced moulded case and air circuit breakers up to 3200A, with the option for remote monitoring and operation.

Weatherproof for outdoor installation, the NS feeder pillar can be either transformer mounted to form part of a compact substation, or free standing. Maximum flexibility is achieved by its stacked busbar system up to 3200A and range of Compact NS moulded case and Masterpact NW air circuit breakers.

For maximum flexibility up to 630A the NS breaker utilises a 'plug-on' cassette factory fitted to the top of the MCCB. The cassette allows the NS breaker to be positioned anywhere on the busbar system whilst ensuring the correct torque for the connection is achieved.

The outdoor switchboard solution comes fully assembled to customer specification for easy installation reducing costly site time, with bottom entry cable connection via individual gland plates. The cable space is protected by an earthed metal screen, whilst each breaker's cable terminations are protected with cable shrouds for maximum safety.





Transparent Ready solutions

Never let your remote outdoor LV switchboard be more than a mouse click away for remote monitoring and operation for efficient energy management. The NS feeder pillar is 'transparent ready' allowing it to be integrated into a building management system through existing LAN network infrastructure on large sites and then monitored centrally from a WAN or over the internet, or alternatively as a stand alone web-enabled solution. Either way real cuts in energy usage can be achieved through analysis and visibility of information about the different forms of energy used by plants and buildings.

Features and benefits

- Operator protection to IPXXB of IEC 60529
- Purpose built, weatherproof enclosure
- Four pole or Three pole and neutral busbar system up to 3200A
- Cable or flange connection to transformer
- Merlin Gerin range of Compact NS and Masterpact NW moulded case or air circuit breakers
- Transparent ready solution optional remote control and monitoring
- Free standing or package substation options available

Busbar ratings
up to 3200A



Outdoor switchboard
solutions



'Plug-on' circuit
breakers up to 630A



Remote monitoring
and control



Opus - Operator Protection Upgradeable Safety

Fuse rails and fuse switch disconnectors

Opus *Intra*, Opus *Plus* and Opus *Excel* have been developed by Merlin Gerin to offer you protection utilising blade type fuselinks to IEC 60269-2-1 and a choice of increased operator safety to suit your application.



Feeder pillar

Transformer mounted or freestanding. The outdoor weatherproof enclosure can be equipped with up to 14 Opus range outgoing circuits.



Opus *Intra* – standard safety

Fuse rail or fuse base

- Opus Intra fuseway base is moulded from durable, flame retardant material
- A robust base for fuse contacts and solid outgoing tin plated copper connections
- Additional shrouding of the Opus Intra fuseway base provides IPXXB operator protection from live conductors when the fuselinks are not in service, or with insulated blade type fuselink tags
- Available in ratings of 400A and 630A, Opus Intra accepts manually inserted size 2 and 3 fuselinks respectively
- Manual insertion of fuse links is achieved with a hand held fuse puller
- Opus Intra fuseway provides a cost effective, simple installation with minimal maintenance



Cable distribution cabinet

Reduced dimensions from that of the feeder pillar makes the cable or distribution cabinet a compact, flexible solution for local street supplies.



Fuseboards

Fully shrouded to provide IPXXB operator protection from live conductors, a fuseboard can be either transformer, wall or floor mounted, even part of a MV/LV substation or kiosk interior.



Opus Plus – increased safety

Manual fuse switch disconnecter

- Increased levels of operator protection are achieved with Opus Plus
- Maximum flexibility in providing 12 possible distribution solutions
- Fully shrouded fuselinks in fuse carriers
- Manual switching is achieved via levers to move the fuse carriers to either the 'on' or 'off' positions
- A parallel switching action contacts with arc control, ensures a swift opening and closing of the circuit
- Operator protection from live conductors in the 'on', 'off' or transitional positions
- Opus Plus is available in ratings of 400A and 630A as either a single pole or triple pole switching operation
- Solid outgoing tin plated copper connections accommodate a cable lug or mechanical connector termination up to 300mm²
- Facility for top or bottom cable entry, or alternatively to the left hand or right hand side



Opus Excel – optimum safety

Independent manual fuse switch disconnecter

- Operator protection from live conductors to IPXXB during all operating conditions
- Mechanical spring assisted switching mechanism enables safety of the highest levels to be achieved. Switching mechanism engages with each fuse carrier in turn to produce an AC22B fault make, load break fuse switch
- Fully interlocked to ensure correct operation and does not rely on the skill of the operator, or the speed at which the lever is moved
- The mechanism is the only means of driving the fuse carrier to the 'on' or 'off' positions
- Facility to remotely monitor the 'on' and 'off' status of the outgoing circuits
- Opus Excel is available in ratings of 400A and 630A with solid outgoing tin plated copper connections
- Can accommodate a cable lug or mechanical connector termination up to 300mm²
- Facility for top or bottom cable entry, or alternatively options to the left hand or right hand side

IPXXB Operator protection



3 types of outgoing protection



Complete typetest equipment



NH blade type fuselinks



Opus - Operator Protection Upgradeable Safety

LV incoming disconnectors, switch disconnectors

The Merlin Gerin range of disconnectors provide operator protection to IPXXB in all operating conditions.

Assembled from single units as either a TP or TP&N horizontal or vertical arrangement the compact and flexible design has enhanced ratings and can accommodate an integral CT for transformer load monitoring.



Incoming disconnector

- Off-load disconnector used to provide a visible point of isolation from the incoming transformer supply.
- Operator protection from live conductors to IPXXB in closed, open and transitional positions.
- Special insulated tool to operate the disconnector.
- Disconnector and insulated handle fully interlocked to ensure that the disconnector cannot be left in a transient position.
- Optional integral current transformers for monitoring transformer load.
- Vertical and horizontal configurations available as either three pole or three pole and neutral assemblies
- Neutral link is rated at 50% that of the phase rating as standard, full size neutrals available upon request.



Current transformers

The disconnector and switch disconnectors accommodate an optional integral CT for incoming load monitoring. The current transformers are encapsulated in epoxy resin within moulded cases and comply with IEC 60185. Test certificates indicating ratio error and phase angle are available upon request for classes 1.0 and 0.5.



Incoming switch disconnector

- On load switch that can be used in conjunction with generator backup for a 'no break' changeover to generator and vice-versa.
- Certified manually dependent switching capability.
- Operator protection from live conductors to IPXXB in 'on', 'off' and transitional positions
- Special insulated tool to operate the switch disconnector.
- Switch disconnector and insulated handle fully interlocked to ensure that the switch disconnector cannot be left in a transient position.
- Optional integral current transformers for monitoring transformer load.
- Vertical and horizontal configurations available as either three pole or three pole and neutral assemblies.
- Neutral link is rated at 50% that of the phase rating as standard, full size neutrals available upon request.

Integral current transformers



Fully interlocked design



IPXXB operator protection



Vertical or horizontal configurations



Other Merlin Gerin public distribution products

Service termination cubicles, service pillars and outdoor enclosures

Outdoor Mini service pillar

A compact fuse service pillar mounted on it's own cable root, provides easy access to outgoing fuse cut outs mounted to a staggered busbar system, providing operator protection to IPXXB during normal service conditions. These outdoor IP33 mini service pillars are freestanding and bottom entry cable connected with a padlockable door handle. The outgoing circuits provide up to 6 x three phase supplies or 18 x single pole supplies with house service cut outs to BS 1361 providing flexible fuse ratings from 5A up to 80A and 100A.

Note fuselinks not included

Outdoor enclosures

The padlockable enclosure with IP33 protection to the internal equipment is offered as standard or IP54 as an option. Available in six sizes from 710mm to 2110mm each is fitted with a 12mm plywood backboard to allow for easy installation of discrete components.

Manufactured in 3mm hot dipped galvanised steel a primary coat of zinc rich epoxy powder paint is applied and oven cured followed by a final top coat of polyester powder paint that is also oven cured. These three layers of corrosion protection and the strong steel assembly ensure that the enclosure will provide many years of reliable service.

Standard colour finish is dark grey to BS 381C although other colours are available as an option.





Service termination cubicle range

Utilising the latest range of Masterpact air or Compact NS moulded circuit breakers the indoor service termination cubicles provides a point of metering, isolation and protection to customers requiring large supplies up to 3200A.

The cubicles floor mounted and for indoor use only with the optional kit for a fault free busbar connection to the Merlin Gerin Prisma range of indoor switchboard. The circuit breaker use the micrologic control units common across all ratings above 800A for protection and also includes a local external trip button and padlock facilities to prevent the breaker from being reset and switched 'On'.

The arrangement provides separate door access to the incoming section and CT metering section. The incoming section provides a gland plate and support for up to 7 x 740mm² incoming cables. Provision is included in the upper section for the installation of 3 metering CT's on removable links. The current transformers can be factory fitted from our wide range of CT's to BS 3938 / 7626 for metering applications or fitted by others. The potential fuses and optional test terminal block are accessible from the front without exposing the operator to live conductors.

Ratings
up to 3200A



Indoor
solution



Micrologic
protection



Direct connection
to Prisma Plus



MODE - Multiple Occupancy Distribution Equipment

MODE is a range of electrical equipment that provides indoor, wall mounted, low voltage distribution up to 500A.



The MODE (Multiple Occupancy Distribution Equipment) range provides a point of distribution, with or without fused incoming isolation, to tariff meters serving multiple occupancy residences, commercial buildings and offices.

Bespoke panel builders have traditionally served the distribution market, but with deregulation opening broader market opportunities, Schneider Electric has recognised the need to provide easily specified, reliable and cost effective packaged solutions. MODE is an elegant example of this approach for Distribution Network Operators (DNOs), since its design makes use of proven and widely used Merlin Gerin products which are available in 13 variants as standard.



300 amp 6 way MODE box



Safety has been considered a high priority in the MODE design and operators are protected to IPXXB with the door open.

Reliability has been assured through both the one-piece combination busbar design of the MODE units and rigorous temperature rise testing. Staggered outgoing phase banks increase cabling access and make multiple cable termination easy though an optional range of outgoing pre-drilled gland plates, which include either conical plastic grommets or suffing glands, installation time is significantly reduced.

The MODE range use house service cut outs to BS 7657 for ratings of up to 100A and for larger supplies over 100A the mode range can accommodate several shielded fuseways for the outgoing distribution circuits. The incoming supply can be provided from an externally mounted heavy duty cut-out for requirements up to 200A, or via an integral Shielded fuseway for ratings up to 500A.

Just four unit types, in three ratings, provide the 13 variants covering from 200A 6-single pole 100A ways up to a 500A 60-single pole 100A ways. The 500A version is also available as standard with a dual incoming and outgoing shielded fuseway and up to 30-single poles 100A ways for distribution or incoming shielded fuseway and up to 12-single pole 200A ways and 3-single pole 100A ways for a landlord supply.

The MODE range includes accessories to accommodate different termination arrangements. As standard all incoming cables are supported with an adjustable cable cleat, with optional mechanical connectors to incoming fuseway removing the need for cable lugs also optional extension boxes for larger incoming waveform cables up to 4C 240mm².

Compact wall mtd
indoor design ✓

IPXXB operator
protection ✓

13 standard
solutions ✓

Wide range of
accessories ✓

Package substations

Our comprehensive range includes:

- Metalclad distribution substations
- In-line package substations
- Unit substations
- Padmount substations
- One-stop engineered package substation
- Fast-Trans substations

This provides customers with a convenient single source of package substation with minimum time and costs.

Ease of specification is guaranteed by one point of contact, from initial enquiry through to manufacture, delivery, commissioning and aftersales service.

Package substations are delivered as one complete unit, minimising logistic costs. Cost savings on installation are achieved by reducing the foundation area due to direct mounting of MV and LV switchgear.





An extensive range of equipment to fulfill your specification

Flexibility is assured through tailored configurations from the wide range of Merlin Gerin products that include:

- Transformers from 200kVA to 2500kVA
- Hermetically sealed
- Free breathing with or without conservator
- Extensible and non extensible Ringmaster MV switchgear
- LV SAIF and Shielded fusegear
- LV ACB cabinets and NS feeder pillars
- Automation and monitoring systems



Ratings
200-2500kVA



Factory
assembled



Single point
of contact



SAIF, Shielded, Opus
or circuit breaker



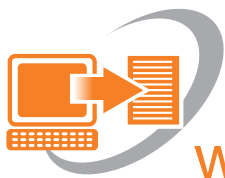
Further information

For your convenience

The complete range of Low Voltage Switchgear literature is available in pdf format on our website, **www.schneider.co.uk**

These can be easily viewed or downloaded, 24 hours a day, 7 days a week. you may access these via the products and services section available under electrical distribution; low voltage switchgear and feeder pillars.

The website also contains further information on our extensive range of electrical distribution, automation and control products, services and local distributor networks.



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Notes

Notes



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