

The use of Merlin Gerin MCCBs and MCBs within Blakley Products

A high proportion of the switchgear that we use within our assemblies is manufactured by Merlin Gerin; MCCBs are manufactured to BS EN 60947-2 and MCBs to BS EN 60947-2 and BS EN 60898. Detailed below are some features of the Merlin Gerin range that have particular relevance to our assemblies.

MCCB Protection

Cascading

The use of Merlin Gerin current limiting MCCBs and MCBs allows an upstream device to provide short-circuit “back-up” protection to downstream devices (known as cascading). Adopting this practice results in substantial space and cost savings on switchgear and enclosures. For instance, when a C60H series 32A TP MCB is fed from an NSX F series MCCB rated at 250A, the short-circuit breaking capacity of the MCB and MCCB in combination is 30 kA (compared to 15 kA for the MCB alone). Similarly, when an NSX F 250A MCCB is fed from an NSX N 630A MCCB, the short-circuit breaking capacity of the two MCCBs in combination is 50 kA (compared to 36 kA for the 250A MCCB alone).

Please refer to our Cascading Chart for detailed information on the reinforced short circuit protection provided by the normal devices that we incorporate.

Discrimination

Merlin Gerin NSX series MCCBs achieve full short circuit discrimination on devices of comparatively close current rating. The simple rule is that the MCCB frame two sizes larger fully discriminates with the frame two sizes smaller i.e. an NSX100 frame device fully discriminates with an NSX250 frame device; an NSX160 frame device fully discriminates with an NSX400 frame device; an NSX250 frame device fully discriminates with an NSX630 frame device. Full information on Discrimination is available from Merlin Gerin.

Adjustability

TM Thermal Magnetic Trips

Most Merlin Gerin MCCBs rated at up to 250A incorporate TM trips which are adjustable between 70% and 100% of nominal rating i.e. a 250A MCCB can be used to protect a 200A circuit.

MCCBs with standard TM trips rated at up to 160A have fixed magnetic (or instantaneous) trips in the range of 8 to 12 times thermal rating. At 200A and 250A most standard “thermal magnetic” MCCBs have adjustable magnetic trips in the range of 5 to 10 times thermal rating.

Electronic Trip MCCBs

Most Merlin Gerin MCCBs rated above 250A have “electronic” trips. These have (i) long time protection (equivalent to thermal protection) that is adjustable from 40% to 100% of the nominal rating i.e. a 630A MCCB can be used to protect a circuit rated as low as 252 amps and (ii) instantaneous or short time protection (short-circuit) that is adjustable from 2 to 10 times thermal (long-time) rating.

MCCBs rated at 250A and below are available to special order with electronic trips. The electronic “thermal” trip has an adjustment range of 40% to 100% i.e. a 100A MCCB can protect a 40A circuit, and the instantaneous or short time setting is adjustable from 2 to 10 times thermal rating. The wide range of adjustability provided by MCCBs with Electronic trips is ideal if a range of loads might be connected to the same MCCB or if details of the loads are not finalised (as is often the case with temporary supplies).

Please note: on adjustable MCCBs, the Instantaneous or Short Time setting is a multiple of the Thermal or Long Time setting and not a multiple of the Nominal rating of the MCCB.

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MCCBs with RCD Protection

MCCBs can be provided with RCD protection in a number of ways.

(i) Most commonly, we provide RCD protection for a circuit protected by an MCCB by fitting a shunt-trip or under volt release coil into the MCCB and controlling the coil via a Blakley VELS or VRCD series adjustable, core balance earth leakage sensor. This method allows TP MCCBs (with solid neutral) or 4P MCCBs (with switched neutral) to be utilised.

VELS series earth leakage sensors are used with MCCBs rated at up to 225A and have a sensitivity adjustment range of 0.1A to 1.0A and a time delay range of 0 to 1 second. VRCD series earth leakage sensors are used with MCCBs rated from 250A to 1250A and have an adjustment range of 0.1A to 2.0A and a time delay range of 0 to 3.5 seconds.

(ii) Up to 630A rating, RCD protection can also be provided by utilising the Merlin Gerin "VIGI" RCD which is attached to the bottom of their 4P MCCBs. This approach is generally more expensive, although a wider range of sensitivity settings is available.

(iii) On circuits rated at 1600A and above, we can utilise the Merlin Gerin Micrologic 6 or Micrologic 7 trips, which are an integral part of the high current rating NS series MCCBs or we can incorporate an earth leakage relay working with multiple CTs operating a shunt-trip within an MCCB with Micrologic 2 trip. The Micrologic 6 provides coarse earth fault protection, whereas the Micrologic 7 and earth leakage relay with multiple CTs provide medium sensitivity earth leakage protection.

Please note: for circuits protected by MCCBs up to 125A, we do not recommend providing RCD protection via DIN rail mounted RCDs. Under short-circuit conditions the energy let through by the MCCB is too great for this type of RCD, which could suffer catastrophic failure.

MCBs

We fit C60H series MCBs up to 63A and use C120H MCBs in certain applications at 100A and 125A.

The C60H range is very comprehensive and has proven very reliable in operation. They can be mounted in pan assemblies or on DIN rail; the current rating range is 1A to 63A; they are available in SP, DP, TP and 4P formats; with "B", "C" and "D" tripping characteristics. A wide range of accessories is available including shunt trips and under voltage releases, making them ideal for sensor based RCD applications and Emergency Stop Circuits. C60H MCBs can also be fitted with VIGI series add-on RCDs and they also work in combination with RMG series RCDs - the combination has a short-circuit rating of 15 kA to BS EN 60947-2. RCBOs are also available in the C60H series and these are ideal for incorporation within pan assemblies.

The C120H series of MCB is DIN rail mounting and is a very compact 125A device. However, given the cable sizes encountered at 100A and 125A, we tend to restrict our use of the device and favour utilising MCCBs at 100A and 125A, which are physically and electrically more robust in design and operation.

ISOBAR MCB Pan Assemblies, TN series

An ISOBAR MCB pan assembly is the Type Tested interior of an MCB distribution board and has fully shrouded bus bars rated at 225A. Pans are widely used on assemblies where the ability to add, remove or change MCBs with the minimum of disruption is a requirement. The TN pan assembly accepts: SP, DP and TP C60H series MCBs rated at up to 63A; SP RCBOs rated at up to 40A; and SP or TP MCB / VIGI RCD combinations. All devices simply "clip" into the pan with no hard wiring required. The electrical connection from each outgoing way of the pan assembly to each MCB pole is controlled by an individual disconnecter, which offers the highest level of safety through electrical isolation of unused ways.

Also available is the N series MCB pan assembly, which incorporates the facility for outgoing MCBs with a switched neutral pole.

If an MCB Pan Assembly is incorporated within a switchboard that has a main protective device rated higher than 225A, then the MCB pan assembly must be fed from an MCCB rated at up to 225A, located within the same board.