

The use of Schneider MCCBs and MCBs within Blakley Products

A high proportion of the switchgear that we use within our assemblies is manufactured by Schneider. 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 Schneider range that have particular relevance to our assemblies.

MCCB Protection

Cascading

The use of Schneider 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 an iC60H 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

Schneider 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 Schneider.

Adjustability

TM Thermal Magnetic Trips

Most Schneider MCCBs rated up to 250A incorporate TM trips, which are adjustable between 70% and 100% of nominal rating i.e. allowing a 250A MCCB to protect a 200A circuit. MCCBs with standard TM trips rated 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 Schneider MCCBs rated above 250A have “electronic” trips. These have (i) long time protection (equivalent to thermal protection) which 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 250 amps and (ii) instantaneous or short time protection, which is adjustable from 2 to 10 times the long time rating.

MCCBs rated at 250A and below are also available with electronic trips. The electronic trip has a long time adjustment range of 40% to 100% of the nominal rating i.e. a 100A MCCB can be used to protect a 40A circuit. The instantaneous or short time protection is adjustable from 2 to 10 times the long time setting. 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 over the course of its life or if details of the loads are not finalised (as is often the case with temporary supplies).

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

MCCBs with RCD Protection

MCCBs can be provided with RCD protection in a number of ways. 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 MRCD series adjustable, core balance, earth leakage sensor. With this arrangement, RCD protection is in accordance with the requirements of BS EN 60947-2 annex m. MCCBs are generally 4 pole, although TP MCCBs with a solid neutral connection can be incorporated.

MRCD series earth leakage sensors are used with MCCBs rated at up to 2500A and have a sensitivity adjustment range which is dependent on the current rating of the circuit (see data sheet PDS053 for the adjustment range). Time delay is adjustable from 0 to 10 seconds.

On circuits rated above 2500A we generally utilise Schneider ACBs or MCCBs fitted with Micrologic 6 trips, which provide earth fault protection.

To protect circuits rated up to 570A we are able to fit Schneider CBRs, which are single devices combining a 4 pole MCCB and an adjustable RCD. The RCD protection is provided by a Micrologic 4 trip (ML 4.1 up to 160A, ML4.2 up to 250A and ML4.3 up to 570A). CBRs take up the same space as a normal MCCB and are quick and easy to fit.

For circuits protected by MCCBs up to 125A, we do not recommend providing RCD protection via DIN rail mounted RCCBs. Under short-circuit conditions the energy let through by the MCCB is too great for an RCCB, which could suffer catastrophic failure.

MCBs

We fit iC60H Acti 9 series MCBs up to 63A and iC120H MCBs in certain applications at 100A and 125A.

The iC60H range is very comprehensive and has proven very reliable in operation. MCBs 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. iC60H MCBs can also be fitted with VIGI series add-on RCDs. MCBs can also work in combination with 2P or 4P RCCBs, although this combination can result in a reduction in breaking capacity. RCBOs are also available in the iC60H series and these are ideal for incorporation within pan assemblies.

The iC120H series of MCB is DIN rail mounting and is a very compact device for ratings up to 125A. However, the cable termination is restricted to 50mm², which needs to be borne in mind. If larger cables are to be terminated, MCCBs should be fitted instead of MCBs.

ISOBAR MCB Pan Assemblies

An ISOBAR MCB pan assembly is the Type Tested interior of an MCB distribution board and has fully shrouded bus bars rated at 250A. Pans are widely used on assemblies where the ability to add, remove or change MCBs with the minimum of disruption is a requirement. Pan assemblies accept: SP, DP and TP iC60H series MCBs rated at up to 63A; SP&N 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. Some pans can incorporate outgoing devices with switched neutral.

If an MCB Pan Assembly is incorporated within a switchboard that has a main protective device rated higher than 250A, then the MCB pan assembly must be protected by an MCCB rated at up to 250A, located within the same board.