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Guide to Selecting a Consumer Unit

Safety is the key to selecting the correct consumer unit for your installation and the first tick on your checklist should be to choose a reputable manufacturer that can guarantee compliance with the British Standard BS EN 61439-3. Below we will take a look from different points of view to give a good understanding and helpful guide to selecting a safe and compliant consumer unit.

Safety and Compliance from a Manufacturers Point of View

Don't be deceived when it comes to buying a consumer unit for installations into domestic households in the UK as there are serious consequences for distributors and installers of counterfeit and non-compliant products as they may not afford the highest safety levels demanded in the UK for such products and even a good installation of a non-compliant product could result in electrocution, fire and even fatality.

It's not easy to spot these products in the market but your insurance certificate is a type test certificate awarded by a recognised independent third party laboratory which should be readily available from reputable manufacturers. At Contactum we use Dekra, a world renowned and industry recognised test lab to certify our products and all of our certificates can be easily downloaded from our website.

Other clues to spotting counterfeit and non-compliant products in the market is to check the product for identification labels indicating CE mark, brand/manufacturer info, technical and installation information, relevant product standards, maximum rated current for the enclosure (InA) and rated conditional short circuit (Icc).

Although probably far too often overlooked it is worth noting that the manufacturers instructions that must be supplied with each product should be understood and followed carefully to confirm the suitability before any installation is undertaken. All of the above points are also a very good reference guide to spot the subtle differences between consumer units in the market and will help identify the difference in price point also.

As a manufacturer the tests our products go through are thorough and deliberate to prove compliance to the relevant standards so it is important you only install same brand devices into each consumer unit. Installing MCBs and RCCBs into a consumer unit, even though they may comply with their respective product standards does not guarantee their compatibility.

The product standard BS EN 61439-3 contains very important tests relating to the performance and safety requirements for the integration of devices and components into an enclosure for household and similar installations.

Two of the most important tests undertaken are temperature rise tests to safeguard against overheating and a specific UK test in annex ZB which requires a 16 kA conditional short-circuit test qualifying it specially as a consumer unit. Without these tests performed, verified and certified, along with other tests the enclosure cannot be classed as a consumer unit and more importantly it cannot be legally installed in the UK in a domestic household or similar installation.

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Safety from an Installers/Specifiers Point of View

So once you have chosen your reputable manufacturer of choice the next item on your checklist should be to confirm compliance with the 18th Edition Wiring Regulations and there are some very specific requirements to be met when considering your consumer unit.

■ Consumer Units and similar switchgear assemblies to be installed within domestic household premises must comply with BS EN 61439-3 Low-voltage switchgear and control gear assemblies' regulations. Distribution boards intended to be operated by ordinary persons. We covered above the best way to ensure this and a type test certificate by a reputable third-party test lab is a great insurance policy to guarantee compliance.

■ Consumer Units must be constructed using a non-combustible material or be contained within a cabinet constructed using a non-combustible material. Ferrous metal, e.g. steel, is deemed to be an example of a non-combustible material and all manufacturers now use steel manufacture consumer units. Since 2015 plastic consumer units are no acceptable for installation in UK domestic households.

■ Devices and components installed in the consumer unit shall only be those declared suitable by the consumer unit manufacturer. Again, we covered this above and the reasons why, but it is also important to note that this not only relates to the practice of installing devices of one manufacturer into consumer units of another manufacturer, but also the practice of installing a newer model device into an older design consumer unit, even if both are from the same manufacturer. Manufacturers advice must be sought before doing this as the type test may not have been carried out to between old and new products.

■ All circuits in domestic properties are now generally covered by 30mA RCCB protection in one way or another but we must now have wider considerations when selecting RCCBs. In the past little consideration was given to the types of load on the circuit and the potential of natural earth leakage from appliances. Nowadays more and more electrical components are used in modern appliances, lighting controls, LED lights, power supplies or any equipment using capacitors so we must select RCCBs according to their type and choose a configuration to avoid build-up of earth leakage in AC and DC currents. Also, as RCCBs do not have integral overload protection, we must now consider this too when selecting for our installation.

■ Unwanted tripping – We generally have two choices when selecting 30mA protection for circuits and looking to avoid nuisance tripping during normal operation

1. Install each circuit using its own 30mA RCBO device. This is by far the best choice as a long-term solution in an installation.
2. Split multiple circuits across 2 RCCBs per consumer unit to achieve the 30mA protection. But the design must be as such that the sum of the leakage currents shall not exceed 30% of the RCCB residual current typically 9mA. Also, the circuits must be divided to avoid danger & hazards caused by unwanted tripping of RCCBs, a single fault should not cause the loss of power to groups of circuits.

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- Type of RCD - based on their ability to deal with various types of residual current. The appropriate RCD shall be selected from the following Type: AC, A, F or B.
1. Type AC - RCDs have been widely used for many years in the UK without any consideration of the types of load in application, but with updated guidance in the 18th edition wiring regs we must now consider if these are still suitable. Characteristics of this RCD are for monitoring AC sinusoidal wave forms only and are for general purpose use.
 2. Type A - RCDs and RCBOs are now available from many consumer unit manufacturers as standard as they are suitable for AC sinusoidal wave forms and Smooth DC $<6\text{mA}$ which are considered to be suitable for PCs, TVs, game consoles and LED lamps which are found in most UK households today. They are also suitable for some EV Car Chargers. Type A RCDs can be used in place of Type AC.
 3. Type F – RCDs are used for frequency-controlled appliances and equipment. Examples of equipment include air conditioning controllers with variable speed drives. They are capable of tripping even if a pure direct current of 10 mA is superimposed on a sinusoidal or pulsed DC differential current. Type F RCD can be used in place of Type A & Type AC RCDs but are not commonly found within consumer units in the UK.
 4. Type B – RCDs are intended to be used for loads with three-phase rectifier, such as variable speed drives, PV systems, EV charging stations and medical equipment. They are for special application and are not found in consumer units.

The different types of RCDs (AC, A, F and B) are nested one within the other like Russian dolls: type B, for example, also complies with the requirements of type F, type A and type AC.

It is true to say that for most applications Type AC devices are suitable but today it is more widely accepted that Type A is now installed as a matter of practice because our home environments are changing at a rapid pace, and the growth of electronic devices being placed on electrical installations requires a more suitable protective monitoring device to cope with the new demands and change in potential rise in earth leakage currents.