

Question 1 to 6 all refer to the following scenario.

A small commercial unit, owned by Paint is Us, located at Unit 7 Wet Industrial Estate, Porchester, PO16 2FH is used for storage of paint. The unit is having a small office area built following the expansion of the business.

The supply and unit forms a 400/230 V 50 Hz TN-C-S system. The main fuses are 100 A BS 88 – 2 and the measured value of PFC is 1600 A. The earthing conductor is a 25mm² copper conductor and the main equipotential bonding conductors to the gas, water and structural steel are 16mm² copper conductors.

One of the existing lighting circuits will be extended and two new ring final circuits will be installed. There are no records from any previous inspection or test. The owner is looking to have the installation insured with a new company, who require up to date documentation prior to issuing of a policy.

All the circuits are wired in thermo plastic, (pvc) singles cable within pvc trunking and conduit. The ambient temperature at the time of testing is 20°C. The test instrument used is a multifunctional type serial number: 08090706A.

The distribution board is located at low level near the main reception area. It is controlled by a 100 A BS EN 60497 – 3 400 V main switch.

The existing lighting circuit has three 70 W high pressure sodium vapour luminaires (SON). Two 55 W fluorescent luminaires controlled by two, two – way switches, are to be added. The additional length added to the circuit is 15 meters. The cable size is 1.5 mm² for all the conductors. The circuit is protected by a 10 A BS EN 60898 Type C circuit breaker with a breaking capacity of 6Ka. (Maximum tabulated value Zs 2.02 Ω).

The ring final circuits are wired in 2.5 mm² conductors supplying a mixture of computers and photocopiers. The circuits have a loop length of 48 and 50 meters respectively and are protected by 32 A BS EN 60898 Type B circuit breaker with a breaking capacity of 6 Ka. (Maximum tabulated value Zs 1.50 Ω). The value f Insulation Resistance measures for this circuit should be taken as greater than 200 mΩ and the polarity was found to conform.

The existing installation conforms to the current edition of BS 7671.

For you information

Size mm ²	mΩ / m at 20°C
1.5	12.10
2.5	7.41

1. a) What inspection and test documentation would be required by the insurance company?
b) State the legal status of the inspector.

- c) With regards to the latest installation what requirements need to be agreed and with whom, before work commences?
 - d) What action would have to be taken before any work, or inspection and testing, is to be conducted.
2. An installation resistance test is required for the extended lighting circuit.
 - a) Describe, with the aid of diagrams, how this would be achieved.
 - b) If the recorded result for this test was 0.5 M Ω describe what actions, if any, would need to be taken.
 3. For both the extended lighting circuit and newly installed ring final circuits list
 - a) in sequence the first **four** tests required
 - b) the instruments to carry out these tests
 4. One year after the completion of the office extension, one of the luminaires in the office area requires replacing.
 - a) Before undertaking the replacement of the luminaire list **three** items that need to be considered.