




# SAFE ELECTRIC Newsletter



2016 has seen many changes in the electrical contracting industry. The first major change following the CER's decision to allocate the current 7 year licence to just one 'Safety Supervisory Body'. On the 12th of November 2015 RECI were awarded the said licence. Over a very short period of time we have had to re-structure and expand our office base. We also had to recruit and train additional Inspectors.

This year saw the introduction of Certificate No 3; this cert should be used for controlled works 2-5. This basically means any installation/modification works that does not require ESB involvement then cert No 3 should be issued.

Introduced this year was the 'Notice of Potential Hazard'. This was a very welcomed document and had been long sought by our members. This new document has been very well accepted and to date in the region of 500 have been issued.

 Also from 1st January 2017 Safe Electric will be moving to communicate more and more with Registered Electrical Contractors using the medium of electronic communication (emails, SMS and web publications, etc). You will receive less and less paper from us going forward. We plan to enhance the responsiveness and cost effectiveness of the services we provide to you using the benefits of modern technology.




This year we ran a number of Roadshows around the country. These proved to be very successful and well attended. We received very good feedback and would like to thank all who attended.

Further roadshows are now being planned for 2017. They will cover a new range of topics. Please try and attend as these roadshows give you an opportunity to keep up to date with the latest industry news.

Locations, topics and dates will be announced early in 2017.



 We are planning to upgrade our electronic certification system during 2017. The current system is near its capacity and unable to accept any further users. A totally new system is planned with smooth integration to windows, android and apple devices. Also the ability to email certs to customers directly from the software package. The proposal is to have all certification and test sheets available. Making the certification a paperless operation. We will keep you updated as we progress.

*We would like to take this opportunity to wish all our members a very Merry Christmas and a Happy New Year.*



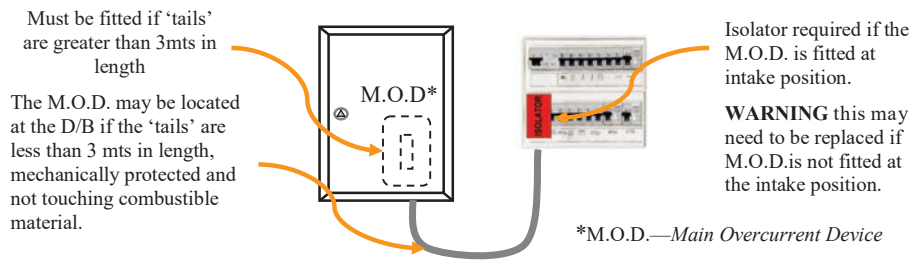
## Christmas Holidays

- Mon 26th Dec - Closed**
- Tue 27th Dec - Closed**
- Wed 28th Dec - Closed**
- Thu 29th Dec - Closed**
- Friday 30th Dec - Closed**
- Mon 2nd Jan - Closed**
- Tue 3rd Jan - Re-opens**

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# ET101 Rule Clarification



Generally the **Main Overcurrent Device** will be located at the intake position. For installation requirements in a domestic or similar situation please refer to the May 2016 newsletter page 11.

We are finding that a number of manufacturers are now installing 63A/80A/100A Isolators in their distribution boards. While this is suitable in most cases to comply with the requirements of 'selectivity'; Inspectors are coming across situations where no overcurrent device is fitted upstream.

This can happen when an existing distribution board is being replaced and it is located beside the meter for example above a back or front door of an older property.

**IMPORTANT** Please ensure that you replace this isolator with an overcurrent device (generally a 63A B type MCB) if no overcurrent device is fitted upstream.

If the M.O.D is not located at the supply point then the tails must be mechanically protected and not placed near combustible material.

To comply with rule 430.4 The max length 'tails' from the main supply point to the main overcurrent device is 3mts in length.

If the 'tails' exceed 3mts in length then an overcurrent device **MUST** be fitted at the main supply point. (*full clarification under section 430 of ET101*)

*Correction:* page 11 of the May 2016 newsletter should have read 50kVA instead of 50kA "b) In the case of installations having a maximum import capacity (MIC) less than 50kA"



## REC's NOT RETURNING NON CONFORMANCE NOTICE'S !

Hager are recalling their 10kA Miniature Circuit Breakers. If you have purchased any 10kA MCBs between the 7th of July and the 5th October this year please visit our website to view full details.

There are still a number of RECs who have failed to return 'Non Conformance Notices' issued by inspectors. Under section C 5.1 of the CER criteria document RECs must return 'Non Conformance Notices' within the time frame set out by the inspector. Disciplinary action is the next stage.

**PLEASE RETURN 'NON CONFORMANCE NOTICES' TO AVOID DISIPLINARY ACTION !**

## WARNING! Main Protective Conductor not in place



The main protective conductor connects the DSO neutral to the consumer's main earthing terminal (MET). It is commonly called the 'Neutralising' conductor. This is a vital part of any TNCS installation to ensure protective devices operate within their parameters. We are coming across an alarming number of installations that are not or have never been 'neutralised', mainly older domestic properties. Please ensure if you are working on an existing installation that you verify the 'Main Protective Conductor' is correctly connected. A high earth loop impedance reading would give a good indication that there is a 'Neutralising' issue. Please rectify immediately or report to the ESB if seals need to be broken. A special ESB helpline is planned to be set up in the New Year. This will assist REC's who encounter this problem. We will inform you as soon as this service becomes available.



ETCI NEWS!



The first TC2 meeting under the NSAI (National Standards Authority of Ireland) is due to take place on the 1st Dec 2016.

We will update you of progress in future Newsletters.

## Frequently Asked Questions

**Q1 - I am wiring a new agricultural building, does the lighting require RCD protection?**

A. Yes, Rule 705.411.3.01 requires that the lighting circuits will need to be protected by an RCD with a rated residual operating not exceeding 300mA.

**Q2 - I am installing SWA cables that contain their own protective conductor do I need to earth the armouring?**

A. Yes, Rule 526.5.2 States: 'Adequate electrical conductance shall be provided between metal sheaths or armouring of cables and the earthing terminals of equipment. This requires proper design or a proprietary method.'

The only way to comply with this rule is to use the correct glanding kit that suit its environment (usually indoor or outdoor). If you correctly gland both ends of the cable using the earth tags, you will then have 2 earth paths (parallel). This in turn will improve your earth loop impedance readings.

**Q3 - I have been asked to install an extract fan in a bathroom of an existing installation. There is currently no RCD protection on the lighting circuit as the installation is approximately 20 years old. It will be located in Zone 3. Will it require RCD protection?**

A. Yes, all new works must comply with the current rules (annex 63B). Options could be to install a local RCBO, relocate the fan outside of the zones or install an SELV fan (12v).

**Q4 - I am replacing a distribution board in an old house. There is no protective conductor at the lighting points is there any action I need to take?**

A. That would depend on the light fitting and switches installed, if they are class II then the situation is satisfactory. If they are class I fittings, metal light switches / switch boxes, then this is not satisfactory. A circuit protective conductor would need to be brought to the accessory or the accessory changed to a class II type. All new work must comply with the current rules which requires a circuit protective conductor to be brought to all lighting points. If the customer refuses the provision of a protective conductor or replacement of an accessory then a 'Notice of Potential Hazard' should be issued.

**Q5 - Can I use a lift shaft to run cables from one level to another?**

A. No, Rule 528.1.2 States: No cable shall be run in a lift shaft unless it forms a part of the lift installation.

## CER Guidance Note

### For RECs working on Distribution Boards of Existing Installations *(Update)*

#### Domestic Electrical installation work



A REC carrying out Controlled Electrical Works 2, 3, 4, or 5, installation work, is required under the Safe Electric scheme to carry out testing of RCD protective devices associated with the new/modified installations to ensure the new works undertaken by the REC have not impaired the safety of the existing installation in line with Chapters 61, 62, 63 and Annex 63B of ET101 National Wiring Rules for Electrical Installations.



RECs working on existing distribution boards shall take cognisance of the distribution board in its entirety.

The following, non-exhaustive, items shall be reviewed while undertaking this work;

- Adequate size of meter tails
- Earthing Arrangements
- Main Protective conductor verified
- Earthing conductor (To Earth Electrode) verified
- Main, Supplementary and local equipotential bonding verified
- Check terminals are tightened to correct torque (check with manufacture, look at purchasing torque screwdriver)
- Check fuse holders are tight with correct gauge ring fitted
- Avoid cutting out of distribution board covers and utilise existing top/rear entry for routing of new cables
- All voids are appropriately fitted with blanking plates
- Withdrawn or notified faulty devices are replaced (E.g. DZ3 fuses withdrawn, and faulty switch fuses

Withdrawn Push-In Slide up Fuse Units; EEC D02 63A AC 22B - Gould 5861.063 DO63A AC22 - Lindner 5861.063 DO 63A AC22 - NES UE 440V 63A - REGIS OSLF 63 1P

Should any of the above or other hazards identified remain to be of sub-standard the REC shall issue a 'Notice of Potential Hazard' form to the customer, as per section C clause 4.7 of the criteria document.

When completing certificate No.3 RECs are required to insert values for insulation resistance, fault loop impedance,  $Z_e$ , and RCDs/RCBOs. These values shall be transcribed from the associated test record sheet. Where RCDs/RCBOs are existing and not installed by the REC, these shall be tested and details completed within the RCD parameter section of the certificate and referenced (via \*) in the comments section stating there are existing device and have not been newly installed.



If an RCD is found not to be operating within the parameters of the National Wiring Rules for Electrical Installations the REC shall issue a Notice of Potential Hazard form to the customer, as per section C clause 4.7 of the criteria document.

If modifying the electrical system, as per controlled works definition, the REC is required to carry out testing of RCD protective devices associated with a new/modified installation to ensure the new works undertaken by the REC have not impaired the safety of the existing installation in accordance with Chapters 61, 62, 63 and Annex 63B of ET101 National Wiring Rules for Electrical Installations.

For example; the installation or removal of a lifestyle choice prepayment meter requires the supply to be de-energised, disconnected, reconnected and re-energised. This will require testing of downstream devices and the relevant data recorded on an associated test record sheet and on accompanying Certificate No. 3.

This includes all test as listed in ET101 National Wiring Rules current addition, for example, Insulation resistance test of the cables installed, Supply loop impedance testing,  $Z_e$ , testing of RCDs downstream of the new/modified works and polarity verified, etc.

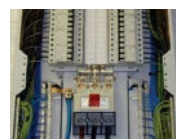
The inclusion of 'N/A' ensures that a box on the certificate cannot be left blank or empty. It is not a means for a REC to avoid performing a test.

Where the work undertaken by a REC does not directly involve working on the RCD circuitry but is working on the distribution board, they are required to undertake the RCD test in accordance with chapter 61 Annex 61G of ET101 National Wiring Rules for Electrical Installations.

#### Commercial/Industrial Electrical Installation Work



Where a REC is working on a distribution board and sub distribution boards are downstream of the distribution board being modified, RCDs contained within the distribution board being modified shall be tested in accordance with Chapter 61 Annex 61G of ET101, National Wiring Rules for Electrical Installations, where possible.



Where it is found that circuits cannot be de-energised in order to test RCDs the REC shall note the reason why RCDs/RCBOs were not tested in the comment section of certificate No.3. It should also be recommended to your client/point of contact that all other RCDs be verified as soon as possible or during the next Periodic Inspection of the premises.

#### Compliance and Co-operation by the REC



Registered Electrical Contractors are required to comply with the above listed requirements, which have been introduced in the **interests of safety**. Safe Electric will oversee the implementation of these requirements to ensure full compliance.

#### Standard Values of Operating Times for RCDs/RCBOs - General (g) Type

Test Current	$\frac{1}{2}(0.5) \times$ RCD Rating	x1 of RCD Rating	x5 of RCD Rating
<b>Example:</b> Test Current for a 30mA Device	15mA	30mA	150mA
Maximum Permitted Operating Times:	Must not Trip	300ms	40ms

# Replacing a Domestic Distribution



These works are defined as 'Controlled works' No 2 and Cert No 3 should be issued upon completion. However if the ESB have to be involved then Cert No 1 will need to be issued.

Where a distribution board is to be replaced, it should comply with the following:

All protective devices fitted to the replacement distribution board should be correctly selected to provide the required protection for existing circuits and any new circuits, in accordance with the current Rules.

This should be verified in the same way as for a new installation, i.e. by tests for fault-loop impedance and RCD operation as specified in Chapter 61 of the Rules.



The conductors connecting the replacement board to the incoming supply should be of at least **16 mm<sup>2</sup>** copper; **replacement may be necessary.**

The main bonding conductors and main protective conductors should be checked for compliance with the Rules and replaced where necessary. (Min of 10mm<sup>2</sup> for gas and water)

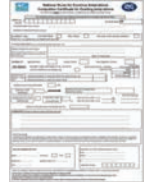
Cables and their terminations should be checked for signs of damage, e.g. heat or mechanical damage, and replaced where necessary.



The replacement of the distribution works must not impair the safety of the existing installation.

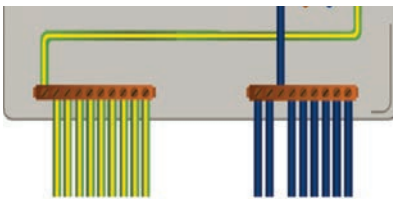
Where a distribution board is being replaced and defects are found in the existing installation then this information must be recorded in the comments section of Cert No 3. If the defects could result in a potential danger then a 'Notice of Potential Hazard' shall be issued.

Prior to replacing the distribution board the incoming polarity should be verified and the external fault loop impedance ( $Z_e$ ) should be checked.



## Beware!

Some distribution board manufacturers are not incorporating an overcurrent device, only an isolating switch. This may need to be replaced if there is no overcurrent device upstream.



Rule 530.5.10 states: *Neutral and protective conductors shall be arranged in the same sequence as the corresponding phase conductors.*

When purchasing a distribution board the installer should ensure that there is an adequate quantity of connection's to comply with the above rule.

**Megger.** Pictured on the right is Sandy Thompson of Megger presenting REC Gary Clynch with a 'Safe Isolation kit' Gary was the lucky winner of a draw run by Megger at our roadshow in The City North Hotel Gormanston, Co. Meath. Megger hosted a stand at the roadshow.



## ET101 Amendment No. 2.2 comes into force next year



The requirement is for 'Twin & Earth' cable have the earth conductor equal size to the phase conductor and to be insulated. From the 5th September 2017 all new circuits **must** be wired using the new cable type.

## Class I or Class II ?



**Class I** : Equipment having basic insulation throughout, and depending on the earthing of exposed conductive parts for protection against indirect contact in the event of failure of the basic insulation.

Equipment in which protection against electric shock does not rely on basic insulation only, but which includes means for the connection of exposed-conductive-parts to a protective conductor in the fixed wiring of the installation.



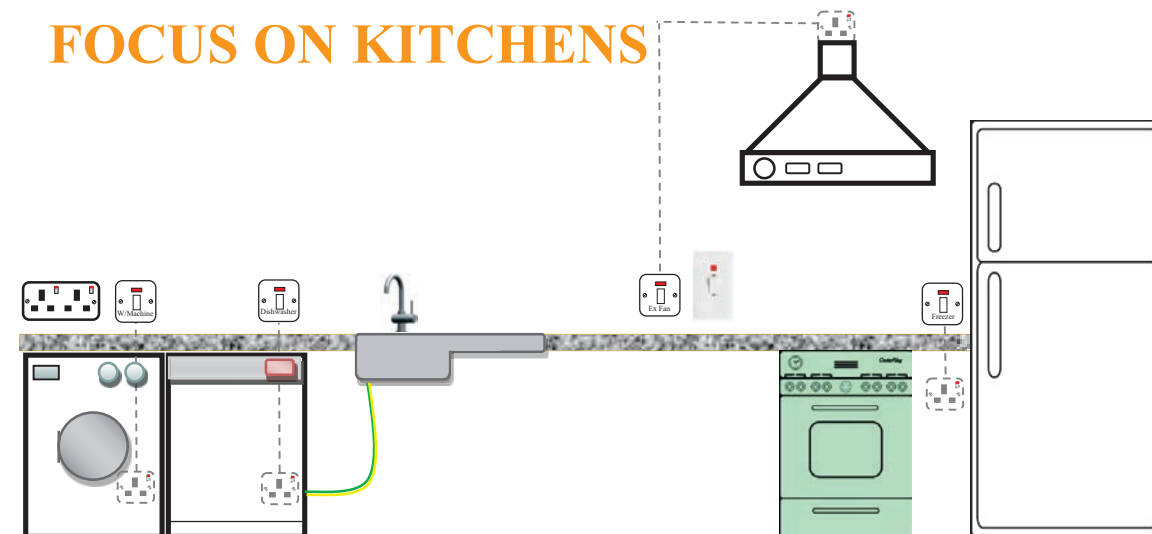
**Class II** : Equipment having double insulation or reinforced insulation, or a combination of these throughout, and whose intermediate parts are protected by supplementary insulation so that there is no risk of indirect contact in the event of failure of basic insulation.

Instead of earthing appliances they can be constructed with 2 layers of insulation preventing the possibility of an external casing becoming live thus eliminating the need for an earth connection.



**Class II equipment can also be made of metal!**

# FOCUS ON KITCHENS



**555.2.1** In domestic and similar installations, an isolating device for a cooking appliance shall **not** be mounted either directly above or behind the appliance.

Where the oven and hob are separate appliances, a common supply and isolator may be used provided:

- each appliance is within **2m** of the switching device.



**555.2.2** In commercial and similar installations, where provision for emergency isolation of cooking equipment is required, the activator shall be within 2m of the equipment.



**554.3.5** A socket-outlet that is not readily accessible, e.g. under or behind an appliance or a kitchen unit, shall be provided with a readily accessible means of isolation, e.g. an isolating switch mounted **nearby** and suitably **labelled**.

## Freezer protected by a dedicated RCD ?



This requirement is found in Annex 55A. This section of the rules is 'Informative' meaning that the rule is not mandatory by its nature.

Being Informative we still feel that this section promotes best practice.

Deviating from best practice may in the future require justification.

i.e. A customer loses a freezer of food because **YOU** made the decision that a dedicated RCD was not required !

We **recommend** that you comply with Annex 55A.

Rule 531.2.5.4 also requires these considerations.

Another option that is given is the use of a fixed outlet (fused connection unit). Where by RCD protection can be omitted. The problem with this option is having to cut the moulded plug top off a freezer. Warranty's may be an issue and also you having to be in attendance for connection.

## 5A Sockets



ET101 requires that 5A Socket-outlets intended for the connection of standard lamps or table lamps need to be controlled by a switch (*usually by the door*), and RCD protected.

We have come across 5A sockets protected by 10A MCB's and unfused plug tops being used by the customer. Please ensure if you do install 5A sockets that you advise the customer to use fused plug tops. Most table lamps require 3A protection.



**544.2.7** A permanent label inscribed "SAFETY ELECTRICAL CONNECTION · DO NOT REMOVE" shall be permanently affixed at the supplementary bonding connection to each pipe.



**544.2.8** In kitchens and utility rooms extraneous conductive parts shall be connected by supplementary bonding to a local protective conductor. Metal sink draining boards may be bonded either:

- directly by a connection to a lug or fixing on the sink or draining board, or
- at connected pipe-work where adequate conductivity exists.

Where such items are not installed by the time the electrical installation is otherwise complete, a bonding conductor shall be provided from a local protective conductor to a termination which is permanently fixed and enclosed in a suitable box located in an appropriate position. The box shall be labelled: "BONDING CONDUCTOR FOR SINK/DRAINING BOARDS".



**544.2.2** Supplementary bonding conductors shall consist of insulated copper conductors with a cross-sectional area in accordance with 544.2.3 or 544.2.4, but not less than **2.5mm<sup>2</sup>** where mechanical protection is provided, or 4mm<sup>2</sup> where mechanical protection is not provided.



## Accredited Verification & Certification Course Providers

*Listed below are course providers you can contact to obtain a QC number*

**METAC Ltd**, Mountrath Enterprise Park, Portlaoise Road, Mountrath, Co. Laois.  
Tel: 057 8756540 Email: info@metac.ie

**iSkill Training**, 12A & B Bluebell B/Park, Old Naas Road, Dublin 12. Tel: 01 4242440 Email: info@iskill.ie

**Solas (Fas)**, Baldoyle Industrial Estate, Baldoyle, Dublin 13. Tel: 01 8167400 Email: info@solas.ie

**ECSSA**, Coolmore House, Park Road, Killarney, Co. Kerry. Tel: 064 6637266 Email: info@ecssa.ie

**Future Skills Ireland Ltd**, 47B Keeper Road, Drimnagh, Dublin 12. Tel: 01 5324058 Email: info@futureskillsireland.ie

# FOCUS ON BATHROOMS

**555.5.2** Where a fan and a luminaire are controlled by the one switch (e.g. in a bathroom), the isolating device shall be in stalled downstream of that switch.



**555.5.3** Where a fan is provided with an automatic time-delay switching-off arrangement, the isolating device shall have a visible means of ON and OFF indication, and shall switch all live conductors, including the neutral.

## INFORMATION

Beware - Some manufactures require the fan to be protected by a 3A fuse.

**701.559.02** Luminaires in **all zones** shall be so constructed that the light bulb is **totally enclosed by a shade or cover**.

*Note: Light bulbs in place must not be accessible without removing the cover.*



In **all zones** of a room containing a bath or shower, every circuit shall be protected by a **dedicated RCD** having a rated residual operating current not exceeding 30mA, except circuits protected by SELV.

Cord-operated switches can be located in zone 3 but must be mounted at a height not less than 2.25mts.

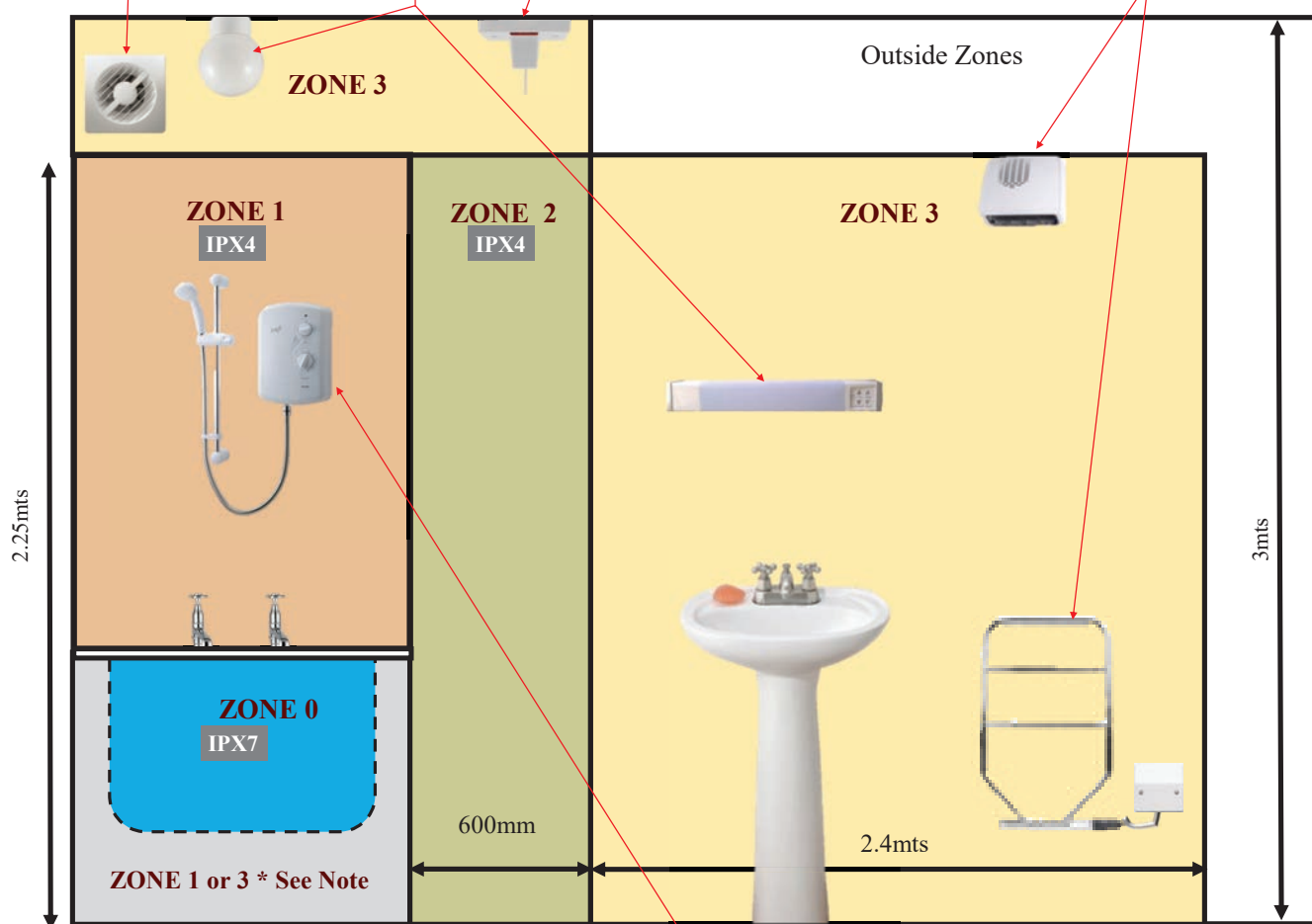


**Do not** mount pull switches where they could be subjected to excessive moisture or dampness. For that reason we would not recommend locating a pull switch as shown.

Wall mounted switches are not permitted in any zone except for SELV type.



Appliances and equipment must be fixed and permanently connected in Zones 2 & 3. Isolation should be located within 2 mts of the appliance. (*between 400mm & 1200mm above the floor*) Usually just outside the bathroom door.



\*Note: Zone 1 includes the space below the bath or shower basin if the space is accessible **without** a tool.

Zone 3 also includes the space below the bath or shower basin if it is accessible only by means of a key or tool.

- for a shower unit without a basin, the vertical plane 2400mm from Zone 1 measured horizontally.



A separate 30mA RCD and MCB, or RCBO, should be provided for each shower unit.

Due to the installation methods of cabling and the amount of insulation in properties we would recommend 10mm<sup>2</sup> cable to allow for the derating of cables (*as shown annex 52C of ET101*). This will also future proof the installation in the event of a higher rated shower being fitted.

As shower switches have been a common problem as regards to fires and contacts burning out, switching with a contactor is recommended.

A problem inspectors have come across when testing showers on inspections, has been that the cooker and the shower have been crossed in the distribution board consequently no RCD protection on the shower. Obviously no testing carried out!



Please ensure that you **ALWAYS** carry out an Earth Loop Impedance test and an RCD test at every shower that you work on. Over the years the electric shower has been the culprit of a number of deaths.

No special IP requirements in Zone 3 or outside the Zones.

Full clarification in ET101 - 701

# When to issue a cert and what cert to issue?

Domestic, small commercial <50kVA

Larger installations Factories etc. ≥50kVA

Any size installation where the ESB are not involved

## Controlled Works - Mandatory Certification Requirements

No	Definition	Cert to be issued	Overview	ESB Involved
1	The installation, commissioning, inspection, and testing of a new fixed electrical installation requiring connection or reconnection to the electricity network.	Cert No 1 or 2	Any works that require an ESB connection or modification	Yes
2	The modification, installation or replacement of a distribution board including customer tails on either side of the Main Protective Device, or new installation in special locations as defined in Part 7 of the National Wiring Rules ET101 and ET105.	Cert No 3 (Cert 1 or 2 if ESB involved)	Distribution board modification and installation works in special locations (i.e. bathrooms, agri, external lighting etc.)	Maybe
3	The installation or replacement of one or more extra circuits in an existing installation, including the installation of one or more additional protective devices for such circuits on a distribution board.	Cert No 3	New Circuit	No
4	Subsystems installed in commercial, industrial and domestic installations where the installation falls within the remit of the Technical Rules.	Cert No 3	Installation works on an installation where you are not the main electrical contractor	No
5	The inspection, testing and Certification of existing electrical installations (in accordance with Chapter 62 of the Wiring Rules (ET 101 –Fourth Edition-2008) and to conform with Regulation 89 of SI No 732 of 2007.	Periodic Inspection Report	Where a customer employs you to carry out a 'Periodic Inspection' of their premises	No
Minor Works	Minor electrical works remain outside the scope of Controlled Electrical Works; these include very small works such as like-for-like replacements (e.g. switches), moving light fittings without affecting the circuit and adding a socket to an existing circuit.	Cert No 3 (If Requested)	When a REC carries out minor works, they must be certified if requested by the customer.	No

**Controlled Electrical Works:** ‘Controlled Electrical Works’ are works that require certification if completed by a REC. While the CER recommends that RECs are hired to complete this work; it is not a legal requirement that only RECs can carry out controlled works.

**Restricted Electrical Works :** ‘Restricted Electrical Works’ are works that can only be carried out by a REC. Restricted works apply to Domestic Premises only.

**Prepay Meters:** The installation, modification or removal of a lifestyle choice prepayment meter falls within the scope of Controlled Works 2. This means that these works require certification, using Completion Certificate No. 3. Please ensure that a cert is issued if you undertake the removal of a prepay meter.

### IMPORTANT

**Returning Cert No 3:** The requirement is that once Cert No 3 is issued, a copy must be returned to our office along with the associated ‘Test Record Sheet’. Please ensure that if you have issued any of these certs that you comply. This will avoid any possible Disciplinary action being taken.

*For full CER certification requirements please read the Criteria document CER/16/001(version 3) Common Procedure No1 this document can be downloaded via our web site.*

## MISUSE OF CERTS!

We are coming across a number RECs who are giving/selling certs to unregistered electricians, who are carrying out illegal works. RECs are given the privilege of self certifying works they undertake.

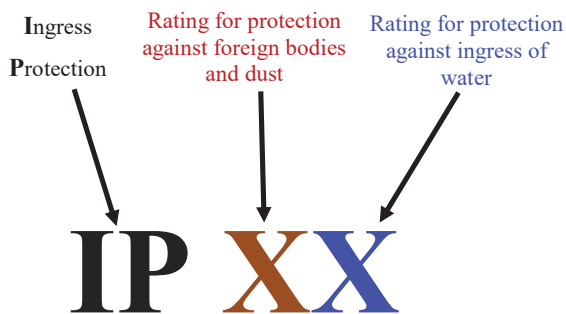
By selling certificates you are undermining the industry and putting your livelihood at risk.

**DISCIPLINARY ACTION WILL BE TAKEN!**

# Table A51C - IP CLASSIFICATION SYSTEM

FIRST NUMERAL - Solids		
<b>X</b>	No Protection	
<b>1</b>	Protected against solid bodies larger than <b>50mm</b>	
<b>2</b>	Protected against solid bodies larger than <b>12mm</b>	
<b>3</b>	Protected against solid bodies larger than <b>2.5mm</b>	
<b>4</b>	Protected against solid bodies larger than <b>1mm</b>	
<b>5</b>	Protected against dust (no harmful deposit)	
<b>6</b>	Completely protected against dust	

SECOND NUMERAL - Water		
<b>X</b>	No Protection	
<b>1</b>	Protected against vertically falling drops of water (condensation)	
<b>2</b>	Protected against drops of water falling at up to 15° from the vertical	
<b>3</b>	Protected against drops of water at up to 60° from the vertical	
<b>4</b>	Protected against projections of water from all directions	
<b>5</b>	Protected against jets of water from all directions	
<b>6</b>	Protected against powerful jets of water	
<b>7</b>	Protected against the effects of temporary immersion	
<b>8</b>	Protected against prolonged effects of continuous immersion	



*Full requirements shown in ET101*

## Examples :

Equipment marked IP55 - is protected against dust (first 5) and protected against jets of water from all directions (second 5)

Equipment marked IPX4 there is no requirement to protect against solids (X) and is protected against projections of water from all directions (4)

*Please ensure that these IP ratings are maintained as part of your installation works. Inspectors often find enclosures have holes drilled in them or cables incorrectly entering them.*



Disclaimer: The information contained within this document is intended for information purposes and Safe Electric accept no responsibility for any inaccuracies.