

SQA Guidance Booklet

Design & Verification of Electrical Installations

BS 7671:2018 (IET Wiring Regulations 18th Edition)

BRITISH STANDARD

BS 7671:2018

Requirements for Electrical Installations

IET Wiring Regulations
Eighteenth Edition

Worked Example No. 2

FINAL CIRCUIT PVC (THERMOPLASTIC) SHEATHED CABLE

A warehouse is to be provided with a new lighting system. To give the required level of illumination 18 modular fittings (with high pressure lamps) are required and each has a total load of 300 watts.

The lighting is to be wired on 2 separate equally loaded radial circuits with thermoplastic insulated and sheathed cables (PVC sheathed) from an existing distribution board which is fitted with BS EN 60898 Type C circuit breakers (CBs). The new circuits will be clipped direct but bunched with two other equally loaded lighting circuits for part of their run and the ambient temperature in the ceiling space will be 35°C. The maximum length of each final circuit will be 20 metres.

The characteristics of the supply are as follows:

Nominal Voltage = 230 volts
PFC at distribution board = 1.5kA
 Z_e at distribution board = 0.25 ohms

Determine the CB current rating and minimum cross-sectional area of cables for each circuit.

ANSWER

STEP 1 CALCULATE DESIGN CURRENT (I_b)

$$\text{Total } I_b = \frac{\text{Watts}}{\text{Volts}} = \frac{18 \times 300}{230} = 23.48 \text{ amps}$$

$$I_b \text{ for each circuit} = \frac{23.48}{2} = 11.74 \text{ amps}$$

$$I_b = \underline{11.74 \text{ amps}}$$

STEP 2 SELECT PROTECTIVE DEVICES

As we have



Excellence in Skills

208

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SQA Customised Award in Design & Verification of Electrical
Installations to BS 7671:2018
(IET Wiring Regulations 18th Edition)

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Course Programme

Day One

- (a) Electrical Installation Design (including worked examples)
Sample case study provided (not assessed)

Day Two

- (a) Principles of Inspection, Testing and Certification (including practical demonstrations)
- (b) Multiple Choice Questionnaire

Day Three

- (a) Review of sample case study
- (b) Case Study
- (c) Revision of Testing and Certification
- (d) Practical Inspection, Testing and Certification exercise

ASSESSMENT

The assessment is carried out as follows with course notes and BS 7671 available for reference.

- (1) A multiple choice questionnaire is attempted by participants at the end of Day Two.

Time allowed 45 minutes

- (2) A case study is attempted by participants in the morning of the Day Three.

Time allowed 2 hours

Course Programme

- (3) A practical exercise carrying out an Inspection, Test and Certification of an installation. A test board simulator is used to facilitate test procedures on Day Three.

Time allowed 2 hours

The SQA certificate is granted on satisfactory demonstration of competence as outlined below.

A candidate may re-sit any part of the assessment where non-achievement takes place.

COMPETENCE

Competence in the performance objective will be demonstrated through the evidence sources by the candidate as follows:

(1) Multiple Choice Question Paper

Producing at least 15 out of 18 correct responses

(2) Case Study

- (a) Selecting an appropriate wiring system and equipment for the assignment given
- (b) Following correct procedures for selecting a suitable cable size using appropriate formulae
- (c) Producing a meaningful response to the information and advice to be given to the client on completion of the installation

Course Programme

(3) Inspection, Testing and Certification Practical Exercise

- (a) Implementing safety procedures correctly
- (b) Carrying out inspection procedure in logical manner
- (c) Carrying out test procedure correctly in the prescribed sequence using appropriate Test equipment
- (d) Completing the Electrical Installation Certificate legibly and correctly
- (e) Completing the Schedule of Inspections legibly and correctly
- (f) Completing the Schedule of Test Results legibly and correctly

Appeals Procedure

All candidates have the right to appeal against any decision made by their Assessor.

Initially, any concern about assessment will be dealt with by the Assessor. If the matter has been discussed and no satisfactory outcome has been achieved, the matter will be referred to the Internal Verifier.

If no satisfactory outcome has been achieved after this discussion, the candidate may appeal to an independent third party. This could be another Internal Verifier not previously involved in the assessment of the candidate or someone from within or from outside the centre with a broad expertise in the award area.

In the case of Appeals relating to the SQA Customised Award Course these may be referred to the External Verifier. If the candidates remain unhappy the final stage is to refer the complaint directly to the awarding body.

Details of the appeal: i.e. its nature, persons involved and dates of discussion and meetings will be recorded as evidence that an appeal has been processed.

The SQA coordinator is required to:

- Retain records including all materials and candidate evidence, of investigations for appeals for a minimum of 3 years and for 6 years if a criminal prosecution/civil case is involved.

Equal Opportunities Statement for Learners

We are committed to promoting diversity and equality of opportunity in training. We aim to treat all learners with dignity and respect and to ensure no learners or potential learners are denied access to training or discriminated against unfairly.

All staff involved in the delivery of the SQA Customised Award qualifications are made aware of the provisions of this document and are offered advice and training, as appropriate, on issues relating to equal opportunities. We expect staff to treat all individuals equally regardless of age, gender, sexual orientation, race, ethnic or national origin, disability, religion, trade union activity or political belief. All staff have a duty to ensure that their personal conduct conforms to our policies and codes of conduct.

We expect all learners to treat staff and other learners with respect and equally regardless of age, gender, sexual orientation, race, ethnic or national origin, disability, religion, trade union activity or political belief.

We aim to provide an environment that promotes equality of opportunity by ensuring that all learners have equal access to the resources needed for their course and that the learning environment is accessible for all learners. We ensure that all materials related to the course are free from any discriminatory language and use clear language and terms that are commonly understood within the industry.

When appropriate we will make alteration to training/assessment to meet the special needs of learners on the SQA Customised Award Courses. If you feel that you need any assistance please speak with your Trainer in the first instance. Any alterations must be agreed with the Internal Verifier and reasons for the changes recorded.

Any learners who consider that they have not been treated in accordance with this policy should submit their complaint in writing to the Internal Verifier. All complaints will be investigated and, if appropriate, remedial action will be taken.

Grievance Procedure

All candidates have the right to raise any concerns on any aspect of their training course.

Initially, any concern about the training course should be dealt with by the Assessor. If the matter has been discussed and no satisfactory outcome has been achieved, the matter will be referred to the SQA coordinator.

However, where the nature of the concern would mean that you are not comfortable raising the grievance with the Assessor, you should contact the SQA coordinator at SELECT.

This process does not cover the assessment process; this is dealt with under the Appeals Procedure.

All candidates have the right to complain to SQA about assessment related matters (but not assessment judgements), once they have exhausted their centre's complaints procedure.

Candidate Induction Security Policy

Information relating to your course including Registration documents and Assessment Materials will be stored at SELECT. This information can only be accessed by relevant staff.

Information will be stored electronically on the SELECT courses database & on SQA Rex/Connect. This is pass-worded & can only be accessed by relevant SELECT staff.

Information will be passed to SQA that relates to your Registration & Certification of the course.

Malpractice Policy

Malpractice is a term that covers any deliberate actions, neglect, default or other practice that compromises the assessment process or validity of a certificate, or credibility and reputation of the SQA.

The following are examples of candidate malpractice.

Plagiarism, Collusion and Personation

Plagiarism and collusion are both forms of cheating something that SELECT and the SQA take very seriously.

Plagiarism involves taking someone else's words or ideas and trying to pass them off as your own. This includes failing to acknowledge sources of information that you have used in your work. Some examples of plagiarism are:

- Including parts of someone else's work in your own without using quotation marks and identifying the source. This includes cutting and pasting information from the internet.
- Copying, re-wording or summarising someone else's work and including it as your own without acknowledging the source.
- Not labelling diagrams/illustrations that you have used.

Collusion involves working together with other students on a task that should have been done on your own. This includes giving assistance to or lending materials to another candidate which they then submit as their own work.

Personation – pretending to be someone else.

How are plagiarism and collusion identified?

There are many ways to identify plagiarism and collusion, including:

- Assessors and Internal Verifiers checking drafts of work may be able to spot changes in the style of writing and use of language.

Malpractice Policy

- Markers are highly experienced subject specialists who are very familiar with work on the topic concerned — they may have read the source you are using (or even marked the essay you are thinking about copying from).

Consequences

If a student is suspected of any malpractice, the tutor will investigate this further and take appropriate action. Appropriate action will depend on the situation but for minor breaches may include work being re-assessed. More serious incidences of malpractice should be referred to the SQA coordinator, who will undertake an investigation. This will be recorded. Where appropriate this will lead to the delegates being removed from the course and if appropriate any certificates declared invalid.

The SQA coordinator is required to:

- Report all cases of malpractice to SQA
- Retain all records of investigations of malpractice. These records should be available to SQA on request. Retention is 3 years or 6 years if criminal prosecution/civil case

GDPR Policy

SELECT takes the security of our Members' and Candidates' personal details very seriously. The following information explains more about how we manage your personal data, and outlines some of your rights regarding our management of it.

What personal data does the SELECT Training department gather?

The SELECT Training department gathers the following items of personal data from candidates who join a course of study at SELECT:

- Full name
- National Insurance number
- Date of birth
- Mobile number
- Home address

GDPR Policy

- Email address
- Scottish Qualifications Authority Candidate number (if known)

How do we gather it?

The SELECT Training department may gather some items of personal data at the time of booking on the course, either by email or by phone, and may gather other items of personal data from candidates on the day of the course.

Why do we need it? What is the legal reason for the gathering and processing of the data?

The personal data that we gather is needed in order to ensure the effective administration of SELECT courses, in order to liaise with the SQA for certification purposes, and in order to ensure that any certificates awarded are posted to the correct address of each candidate. We require the mobile and email address of candidates for the purpose of communication of changes to course arrangements, or potential short-notice cancellation of a course. The legal reason for the gathering, processing, and storage of this data is that it is necessary for the performance of a contract.

How do we store it?

The personal data gathered is stored in password protected systems, and locked filing cabinets.

Who has access to it?

The personal data gathered is accessed by SELECT members of staff employed in the Training department only for the purposes of exercising the duties of their role.

How/why might it be deleted if I don't request for it to be deleted?

The personal data gathered will be stored for a period of 2 years from the date of the course, after which time it will be permanently deleted, and hard copy records confidentially destroyed.

How can I request for my data to stop being processed in this way?

Please call 0131 445 5577 and ask to be transferred to the Training Department, or email training@select.org.uk to make this request.

How can I find out more about what SELECT does with my personal data?

Please see our GDPR Data Protection Policy which can be found on www.select.org.uk for more information.

How SQA uses Personal Data

Please click on the link below to see how SQA uses candidate's personal data:

<https://www.sqa.org.uk/sqa/45397.html>

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