-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

HIGHER NATIONAL UNIT SPECIFICATION

GENERAL INFORMATION

-Unit number-	**D7YP 04**
-Unit title-	**MAINS AND EXTRA LOW VOLTAGE POWER SUPPLIES**
-Superclass category-	**XJ**
-Date of publication- (month and year)	**JANUARY 2002**
-Originating centre for unit-	**SQA**

-DESCRIPTION-

GENERAL COMPETENCE FOR UNIT: Developing knowledge and understanding of mains and extra low voltage power supplies the security industry C.C.T.V. sector.

OUTCOMES:

1. explain the need for visual inspection and testing of low voltage supplies;

2. describe safety precautions to be observed and procedures when testing low voltage supplies;

3. demonstrate correct test procedures for mains tests to BS7671 and record results on appropriate commercial forms;

4. explain the requirements of BS2769 for the safe use of portable equipment;

5. describe briefly each of the listed types of power supplies;

6. describe precautions when working on extra low-voltage power supplies.

CREDIT VALUE: 2 HN Credits.

ACCESS STATEMENT: Access to this unit is at the discretion of the centre. However, it would be beneficial if the candidate has completed Introduction to the Security Industry CCTV unit and prior knowledge of Electrical/Electronic Principles and Components.

Additional copies of this unit can be obtained from:

The Committee and Administration Unit, SQA, Hanover House, 24 Douglas Street, Glasgow G2 7NQ, (Tel: 0141-242 2168).

At the time of publication the cost is £2.50 per unit (minimum order £5.00).

HIGHER NATIONAL UNIT SPECIFICATION

STATEMENT OF STANDARDS

Unit number: D7YP 04

Unit title: MAINS AND EXTRA LOW VOLTAGE POWER SUPPLIES

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME

1. EXPLAIN THE NEED FOR VISUAL INSPECTION AND TESTING OF LOW VOLTAGE SUPPLIES

PERFORMANCE CRITERIA

(a) Explain the requirements for visual inspection.
(b) The recommended sequence of initial tests to be carried out is described clearly and correctly.
(c) The reason for periodic inspection and testing are clearly described.

RANGE STATEMENT

Testing of low-voltage supply to the system to relevant requirements of the BS7671 IEE Wiring Regulations.

EVIDENCE REQUIREMENTS

Written and/or oral evidence of the candidate's ability to state all performance criteria in the range.

OUTCOME

2. DESCRIBE, SAFETY PRECAUTIONS TO BE OBSERVED AND PROCEDURES WHEN TESTING LOW VOLTAGE SUPPLIES

PERFORMANCE CRITERIA

(a) Describe typical test results expected for listed tests.
(b) Explain safety precautions to be observed during tests.
(c) Describe procedures for recording the test results.

RANGE STATEMENT

Testing of low-voltage supply to the system to relevant requirements of the BS7671.

Statutory requirements: Local Authority requirements.

EVIDENCE REQUIREMENTS

Written and/or oral evidence of the candidate's ability to satisfy all performance criteria and cover the range.

OUTCOME

3. DEMONSTRATE CORRECT TEST PROCEDURES FOR MAINS TESTS TO BS7671 AND RECORD RESULTS ON APPROPRIATE COMMERCIAL FORMS

PERFORMANCE CRITERIA

(a) Demonstrate procedure for completing a risk assessment prior to working on low voltage system.
(b) Determine, minimum earthing requirements for an electrical installation.
(c) Demonstrate safely the appropriate test procedures for mains tests correctly to relevant parts of BS7671.
(d) Correctly record the test results using propriety or commercial forms as appropriate. Indicating which readings are unacceptable if appropriate.

RANGE STATEMENT

Testing of typical low-voltage supply system as used in a CCTV installation and/or alarm system to relevant requirements of the BS7616.

EVIDENCE REQUIREMENTS

Observation and written and/or oral evidence of the candidate's ability to demonstrate and satisfy all performance criteria and cover the range.

OUTCOME

4. EXPLAIN THE REQUIREMENTS OF BS2769 FOR THE SAFE USE OF PORTABLE EQUIPMENT

PERFORMANCE CRITERIA

(a) Explain the requirements of BS2769 for the safe use of portable equipment.

RANGE STATEMENT

Portable electric tools, power supplies and equipment “CENELEC” HD400, IEE Code of Practice for inspection and testing of Electrical Equipment.

EVIDENCE REQUIREMENTS

Written and/or oral evidence which satisfies all the performance criteria and covers the range.

OUTCOME

5. DESCRIBE BRIEFLY EACH OF THE LISTED TYPES OF POWER SUPPLIES

PERFORMANCE CRITERIA

(a) Identify the key component parts of a power supply used in CCTV equipment.
(b) Describe each of the listed types of power supply.
(c) Explain the use of primary cells for maintaining memory function.

RANGE STATEMENT

Power supply units: (i) combined with a control unit eg. telemetry; (ii) separately housed for remote location eg. camera housing; (iii) British Telecom approved types for PSTN working other; (iv) line fed systems.

Local earthing requirements of low voltage equipment. Ground loops.

The HASAWA requirements for the safe disposal of primary cells under COSHH regulations eg. lithium and secondary cells eg. Nickel Cadmium and lead acid. Voltage regulators, transformers and bridge rectifiers.

EVIDENCE REQUIREMENTS

Written and/or oral evidence of the candidate’s ability to describe and identify systems and components, which satisfy all the performance criteria and cover the range.

OUTCOME

6. DESCRIBE PRECAUTIONS WHEN WORKING ON EXTRA LOW-VOLTAGE POWER SUPPLIES

PERFORMANCE CRITERIA

(a) Describe the safety precautions when working with power supply units.
(b) Explain how an unshielded power supply can affect a CCTV video signal.

RANGE STATEMENT

Power supply units: (i) combined with a control unit eg. telemetry; (ii) separately housed for remote location eg. camera housing; (iii) British Telecom approved types for PSTN working other; (iv) line fed systems.

Local earthing requirements of low voltage equipment ground loops.

EVIDENCE REQUIREMENTS

Written and/or oral evidence of the candidates to satisfy all the performance criteria and cover the range.

MERIT STATEMENT: To gain a pass in this unit, a candidate must meet the standards set out in the outcomes, performance criteria, range statements and evidence requirements.

To achieve a merit in this unit, a candidate must demonstrate a superior or more sophisticated level of performance. In this unit this might be shown in the following ways:

(i) demonstrating practically the correct testing procedures and produce the necessary documentation;
(ii) the candidate must show a good understanding of all the relevant British Standards with respect to power supply needs.

ASSESSMENT

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the Scottish Qualifications Authority (SQA) assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of the assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

SPECIAL NEEDS

Proposals to modify outcomes, range statements or agreed assessment arrangements should be discussed in the first place with the external verifier.

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SUPPORT NOTES

Unit number: D7YP 04

Unit title: MAINS AND EXTRA LOW VOLTAGE POWER SUPPLIES

SUPPORT NOTES: This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

Outcomes 1 and 2

Requires the testing of low-voltage supply to the system to relevant requirements of the BS7671 IEE Wiring Regulations.

Outcome 3

A good knowledge of testing of typical low-voltage supply system as used in a CCTV installation and/or alarm system to relevant requirements of the BS7616.

Outcome 4

An understanding of testing portable electric tools, power supplies and equipment CENELEC HD 400, IEE Code of Practice for inspection and testing of Electrical Equipment.

Outcome 5

A knowledge of the HASAWA requirements for the safe disposal of primary cells under COSHH regulations eg. lithium and secondary cells eg. nickel cadmium and lead acid, voltage regulators, transformers and bridge rectifiers.

Outcome 6

Awareness of the need for local earthing requirements of low voltage equipment ground loops.

NOTIONAL DESIGN LENGTH: SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 80 hours. The use of notional design length for programme design and timetabling is advisory only.

PURPOSE SQA publishes summaries of HN units for easy reference, publicity purposes, centre handbooks, etc. The summary statement for this unit is as follows:

On completion of this module, the candidate will have a good knowledge of power supplies for CCTV within the Security Industry Sector.

RECOGNITION This unit has been developed in conjunction with SQA and is one component of the underpinning knowledge for PDA in CCTV within the security industry.

Many SQA HN units are recognised for entry/recruitment purposes. For up-to-date information see the SQA guide 'Recognised Groupings of Higher National Certificate Modules.

REFERENCES

1. Guide to unit writing, SQA, 1993 (Code: A018).
2. Guide to assessment, SQA, 1993 (Code: B005).
3. Guide to certification, SQA, 1996 (Code: F025).
4. Notes for unit writers, SQA, 1995 (Code: A041).

For details of other SQA publications, please contact staff in the Sales and Despatch section (Tel: 0141-242 2168) who can supply you with a copy of the publication list (Code: X037).

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