

Domain**Control and Instrumentation****Title:****Install instrumentation and control equipment****Level: 3****Credits: 5****Purpose**

This unit standard specifies the competencies required to Install instrumentation and control equipment. It includes Prepare for installation, Select and install cables, set up instrument and control equipment. This unit standard is intended for those who work

Special Notes

1. Entry information:

Prerequisite

- *Unit I&C01 - Apply and maintain safety rules in Instrumentation and Control Workplace environment*
- *Unit I&C02 - Plan and organise work in instrumentation work environment*

2. Assessment evidence may be collected from a real or a simulated workplace in which instrumentation operations are carried out.

3. To demonstrate competence, minimum evidence of installation of at least one of each instrument relevant to this unit standard. Including cable identification and selection of cable types and sizes,

4. Typical installation includes but is not limited to pressure, level, density, flow measurement instruments and control equipment.

5. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' guidelines and instructions.

6. Installation of instrument must comply with specific recommended practices for hazardous (classified) areas.

7. Glossary of terms:

- *specifications'* refers to any, or all of the following: manufacturers' specifications and recommendations, workplace specific requirements

8. Regulations and legislation relevant to this unit standard include the following:

- Labour Act 2007, No. 11, 2007
- IEEE 518
- Regulations relating to the health & safety of employees at work under Schedule 1 (2) of the Labour Act No.11 of 2007
- And all subsequent amendments.

6. Performance of all elements in this unit standard must comply with industry standards.

Quality Assurance Requirements

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority and the Namibia Training Authority. All approved unit standards, qualifications and national assessment arrangements are available on the Namibia Training Authority website www.nta.com.na.

Elements and Performance Criteria

Element 1: Prepare for installation

Range

Planning and preparation may include but is not limited to scope of work of the intended installation

Performance Criteria

- 1.1 Work instructions including job cards, diagrams specifications and operational details are obtained, confirmed and applied.
- 1.2 Installation location is identified in accordance with job requirement.
- 1.3 Materials, tools and equipment are selected to meet job requirements.
- 1.4 Environmental protection requirements identified and applied in line with environmental legislation.

Element 2: Select and install cables

Range

Selecting and installing cables may include not limited to cable sizing (current and voltage carrying capacity, cross-sectional area of conductor, number of cores), cable type, shield requirements, IP rating and armouring requirements

Installing of cable enclosures may include but is not limited to junction boxes, T- boxes, din rails, splicing trays.

Material may include but is not limited to bolts and nuts, unit struts, anchoring bolts
Laying of cables may include but not limited to pulling cables, stripping and alignment

Performance Criteria

- 2.1 Cable size, type and length are selected based on load to be supplied, permissible voltage drop, current carrying capacity, and environmental condition of installation and routing of the cable.
- 2.3 Desired cable length is ensured when cutting.
- 2.4 Strapping of cable with appropriate strapping medium as per installation requirements.

- 2.5 Tag cables as per functional specification and workplace standards.

Element 3: Set up instrument and control equipment

Range

Installation diagrams and drawings are to include but not limited to process flow diagrams, electrical power distribution drawings, process and instrument drawings (P&IDs), loop drawings and bus layouts.

Mounting of instrument may include but is not limited to taking measurements, marking off, install, align and tightening of bolts.

Performance criteria

- 3.1 Personal and plant safety precautions are followed in accordance with company procedures.
- 3.2. Installation diagrams and drawings are interpreted to meet the job requirements.
- 3.3 Tools and equipment are selected and used according to type of device as per manufacturers' specifications.
- 3.4 Devices are selected according to process application, environment and engineered designs.
- 3.5 Mounting locations are selected according to engineered designs and manufacturers' specifications.
- 3.6 Devices are mounted according to engineered designs and manufacturers' specifications.
- 3.7 Pipework is installed and connected in accordance with manufacturer's recommendations and installation drawings.
- 3.5. Electrical installation is completed in accordance with relevant statutory, regulatory standards and manufacture's recommendations
- 1.5 Enclosures and panels to hold devices and indicators are modified according to workplace procedures.
- 1.6 Devices are connected to the process using tubing, in-line installation and thermo-well according to engineered designs.
- 1.7 Wiring is terminated to devices according to engineered designs and manufacturers' specifications.
- 1.8 Devices are configured and calibrated according to manufacturers' instructions, process requirements and data sheets.

- 1.9 Device operations are verified within specified parameters by use of test equipment and procedures.
- 1.10 Configuration and calibration settings are performed according to manufacturing specifications.
- 1.11 Configuration and calibration settings are backed up and documented according to workplace procedures.

Registration Data

Subfield:	Electrical Engineering
Date first registered:	
Date this version registered:	
Anticipated review:	
Body responsible for review:	Namibia Training Authority