CONSTRUCTION INDUSTRY COUNCIL
建造業議會

HONG KONG CONSTRUCTION INDUSTRY TRADE TESTING CENTRE
香港建造業工藝測試中心

Fire Service Electrical Fitter
Trade Test
Practical Test Mock Paper

(Version：EFE-PM-EN-02)

此文件關於消防電氣裝配工技能測試實務測試模擬試題。
如需索取中文版本，請致電 2100 9000 與香港建造業工藝測試中心聯絡。

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Fire Service Electrical Fitter

Trade Test Practical Test Mock Paper

Title: Fire Service Electrical Fitter

Skill level: Skilled Worker

Test Requirements and Duration:

Procedures and requirements	Duration
1. **Dynamic risk assessment prior to work** Conduct dynamic risk assessment on worksite environment, equipment and tools, materials and safety equipment prior to work, including identification of potential hazards and taking countermeasures to ensure that potential hazards are eliminated and/or risks are reduced before commencement of work.	5 minutes
2. **Preparation prior to work and protection to work site** Review the worksite delivered by the person-in-charge / worker of the previous work process, and perform proper protection as well as appropriate preparations before commencement of work according to the worksite environment and the conditions of the workpiece etc.	5 minutes
3. **Practical Test** Carry out the works in accordance with the requirements, specifications and drawing(s), and complete the specified works at the designated locations. **Test Content** **1. Installation of Fire Alarm Control Panel** Refer to Working Drawings 1 to 5 and complete the following tasks: i. Install the required number of relays, diodes, and resistors, and complete the wiring between the Automatic Fire Alarm Control Panel (FACP) and the associated interfacing systems in accordance with the working drawings. ii. Carry out Functional Test 1: a. Three-zone input circuit test; b. One-zone output circuit test; and c. Fault monitoring test.	3 hours

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Fire Service Electrical Fitter

Trade Test Practical Test Mock Paper (Con't)

Test Requirements and Duration (con't):

Procedures and requirements	Duration
Test Content (Con't)	Refer to previous page

1. Installation of Fire Alarm Control Panel (con't)

iii. Carry out Functional Test 2. The system shall operate in accordance with the following requirements:

Trigger Device	Required Operation
Heat Detector	Fire Alarm Bell and Flashing Beacon operate
Smoke Detector	Fire Alarm Bell and Flashing Beacon operate
Manual Call Zone	Fire Alarm Bell, Flashing Beacon and Fire Pump operate
Heat Detector and Smoke Detector	Fire Alarm Buzzer, Fire Alarm Bell and Flashing Beacon operate
Any Fault / Fire Alarm Signal	Air Conditioning Simulator System stops operating

2. Installation of MICC Cable

i. Properly terminate the Mineral Insulated Copper-Clad Cable (MICC Cable) and connect it to the terminals of the adaptable junction box in accordance with the working drawing. (Refer to Working Drawings 6)

ii. Upon completion, restore the Automatic Fire Alarm Control Panel to its normal operating condition as directed by the invigilator.

iii. Armoured Cable Installation

iv. Properly terminate the Armoured Cable and connect it to the terminals of the adaptable junction box in accordance with the working drawing. (Refer to Working Drawings 7)

3. Pump Motor Simulator Connection

i. Connect the Fire Pump Control Box to the Pump Motor Simulator in accordance with the working drawing. (Refer to Working Drawings 8)

ii. After completing the wiring, perform the necessary checks and tests using appropriate test instruments.

iii. Upon satisfactory completion, notify the invigilator for functional testing

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Fire Service Electrical Fitter
Trade Test Practical Test Mock Paper (Con't)

Test Requirements and Duration (con't):

Procedures and requirements	Duration
4 . <u>Housekeeping after work and final touch-up on work before handover</u> After completion of work, clean and tidy up the worksite, equipment, tools and materials, and review the quality of workpiece taking into account of the possible impact on the upcoming work process. The finished workpiece should be properly handled in preparation for delivery along with the worksite.	5 minutes

Note:

1. Candidates should read the attached "Notes to Candidate" before commencement of work and comply with all test related rules and requirements.

2. Practical test assessment framework is comprised of "Technical Assessment" and "Dynamic Risk Assessment and Safety Practice Assessment". Candidates must fulfil the passing requirements for both assessment parts to achieve an overall "Pass" grade in the practical test.

Passing Requirement for "Technical Assessment"	Passing Requirement for "Dynamic risk Assessment and Safety Practice Assessment"
Achieve 60 marks out of 100 marks; and meet the specific requirement(s) in the critical assessment items of the technical assessment.	Achieve 60 marks out of 100 marks; and meet the specific requirement(s) in the critical assessment items of "Dynamic Risk Assessment and Safety Practice Assessment".

Precautions

This document is provided as reference for test preparation only. Under all circumstances all content in the official test papers, including but not limited to the terms and conditions therein, prevails.

There are different versions of the test paper, content include but not limited to tools, materials, equipment, drawing, construction details or procedures and different simulated site environments. Candidates should refer to the official test documents during testing. The CIC reserves the right, at its sole and absolute discretion, to change, update or delete the contents in this document at any time without prior notice.

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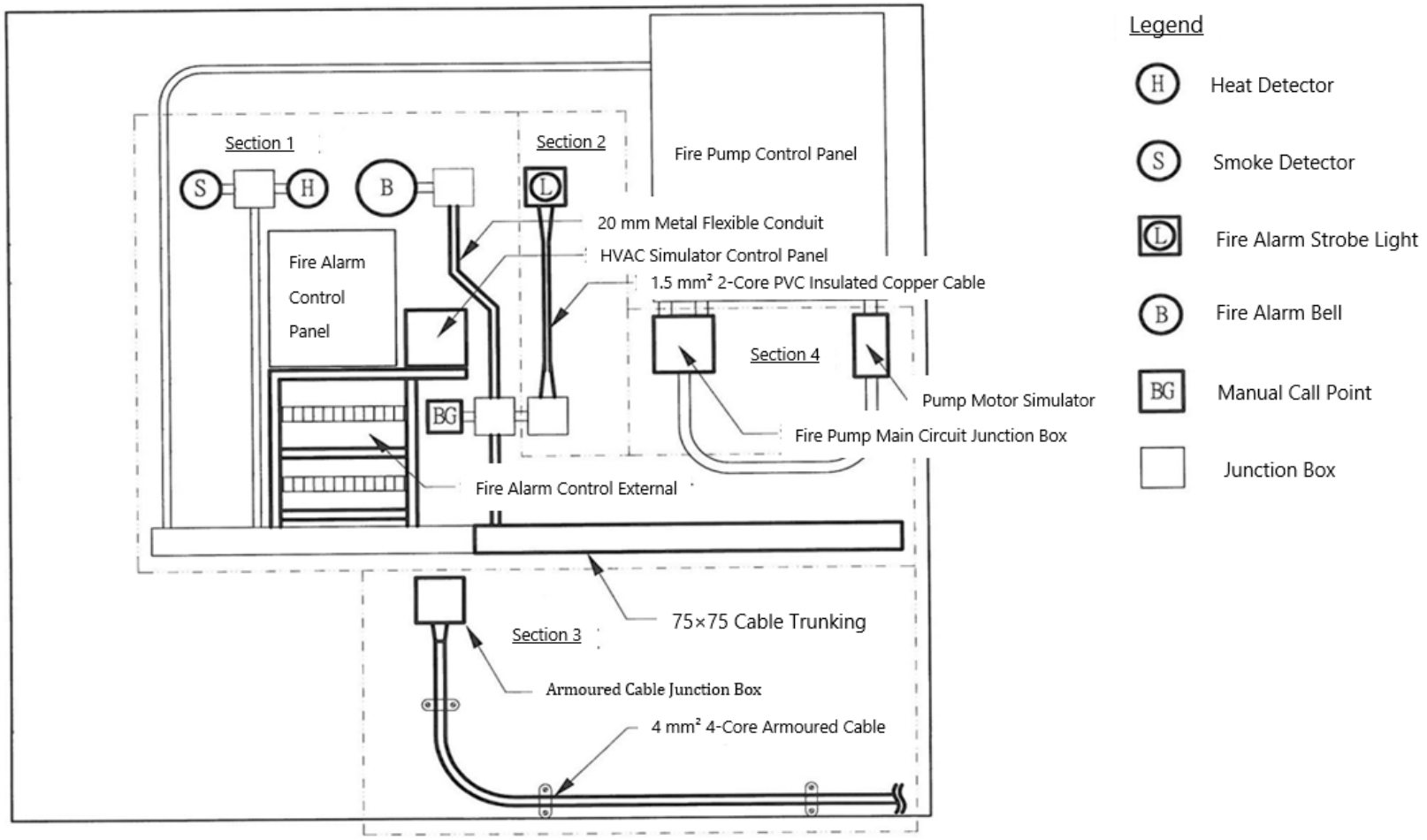
Working Drawing (1)



Note: Thick lines indicate the installation, cable pulling and wiring portions for the practical skills test.

Note :

① Drawing not to scale

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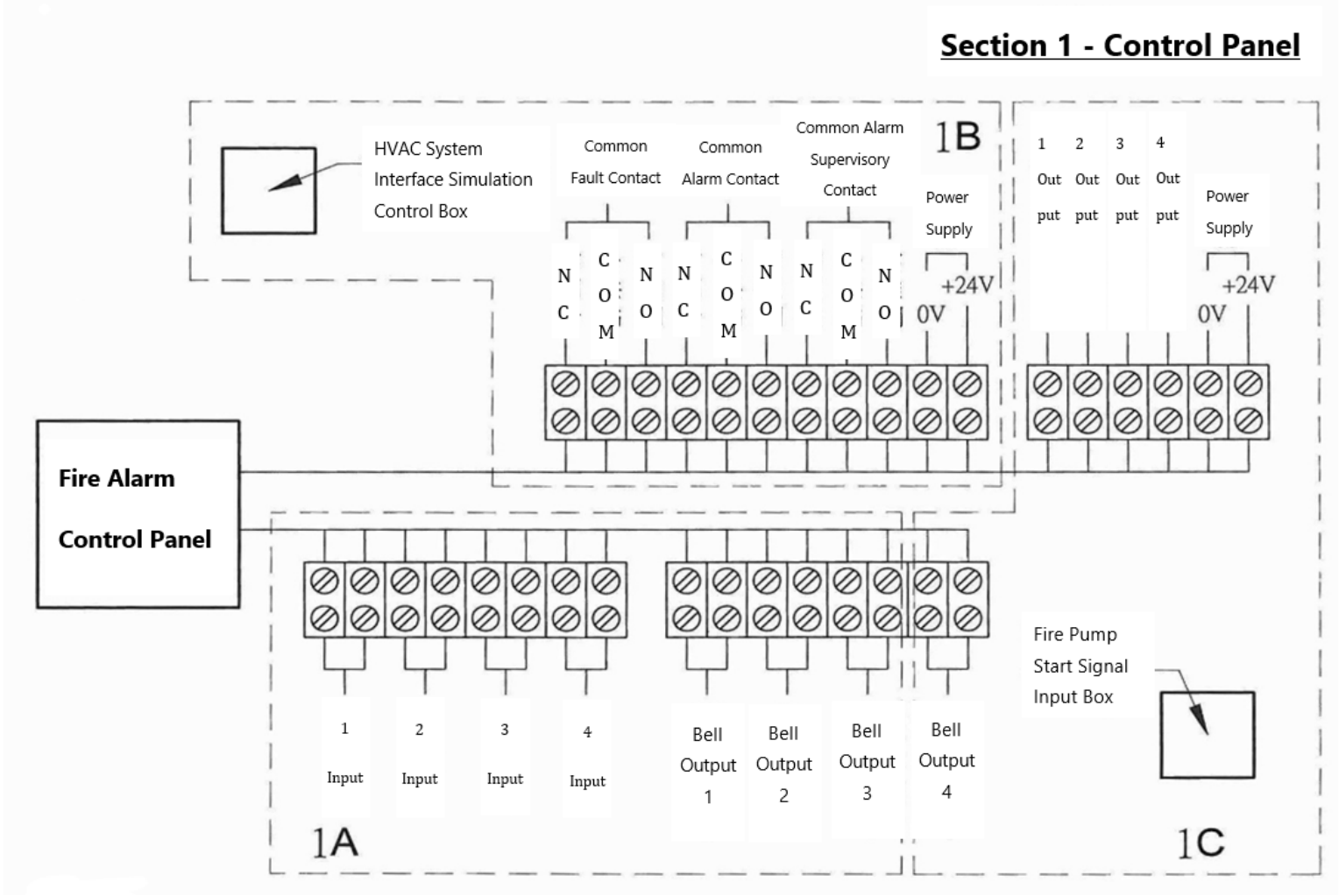
Working Drawing (2)



Note :

① Drawing not to scale

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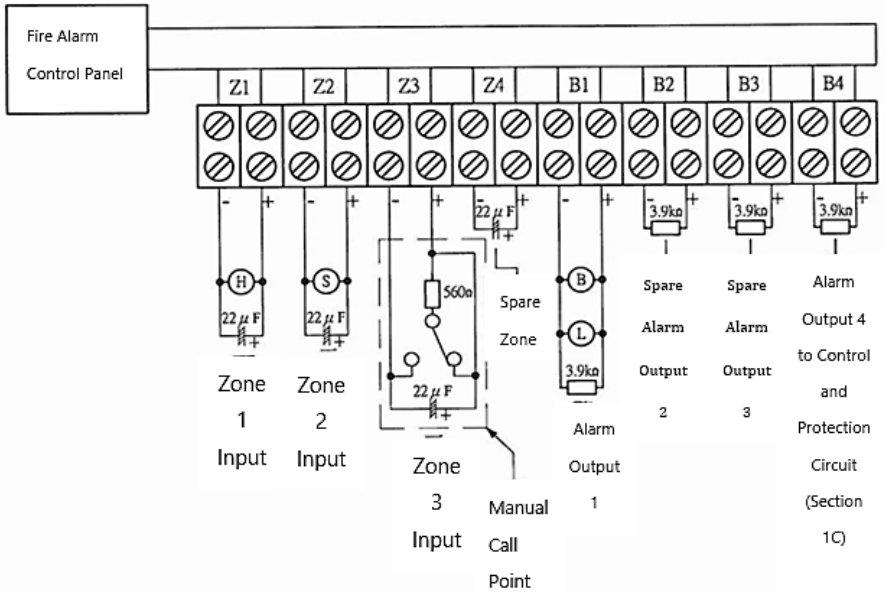
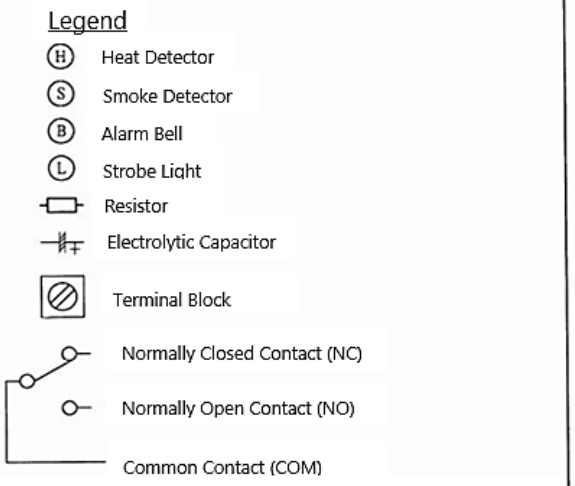
Working Drawing (3)



Notes:

1. Candidates must conduct an earth fault resistance test under the supervision of the invigilator. The earth fault resistance value for Zone 1, Zone 2 and Zone 3 input circuits shall not be less than **40 kΩ**.
2. The power supply may only be connected after completion of the earth fault resistance test and confirmation by the invigilator.
3. Correct polarity must be maintained for all wiring connections. Incorrect polarity will result in mark deduction.

Section 1 (1A) - Inputs and Outputs



Requirements:

Run cables from the Fire Alarm Control Panel to the input points and output points of Zones 1, 2 and 3. Connect them to the Heat Detector, Smoke Detector, Manual Call Point, Alarm Bell and Strobe Light as shown in the diagram. Install all associated components including end-of-line resistors, capacitors and alarm resistors according to the wiring schematic.

Testing Standard:

Each circuit shall be tested for both alarm and fault conditions.

Under normal condition, only the power indicator on the Fire Alarm Control Panel shall be illuminated.

During a fault condition, the fault indicator shall be illuminated.

During an alarm condition, the alarm indicator shall be illuminated.

Note :

① Drawing not to scale

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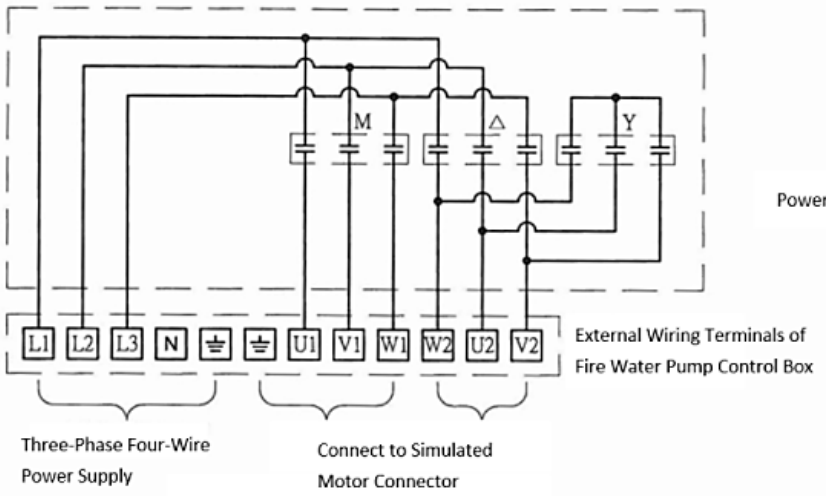
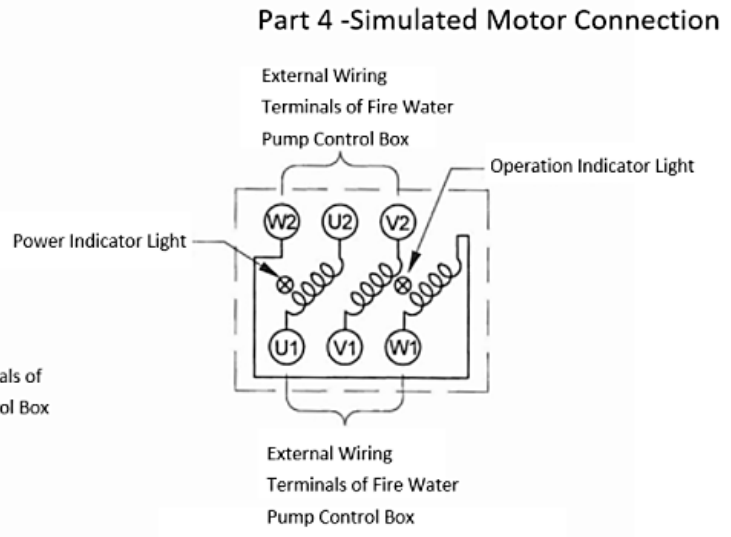
Working Drawing (4)



Main Control Circuit of Fire Water Pump



Terminal Arrangement Diagram of Simulated Motor Connector

Requirements

According to the drawing instructions, connect the three-phase four-wire power supply to the external wiring terminals of the water pump control box, and connect wires from the external wiring terminals of the water pump control box to the simulated motor connector.

Testing Standards:

The three-phase power supply is connected correctly, and the yellow power normal indicator light is on.
The simulated motor connector is connected correctly (phase sequence must be in order), and the green operation indicator light is on.

Note :

① Drawing not to scale

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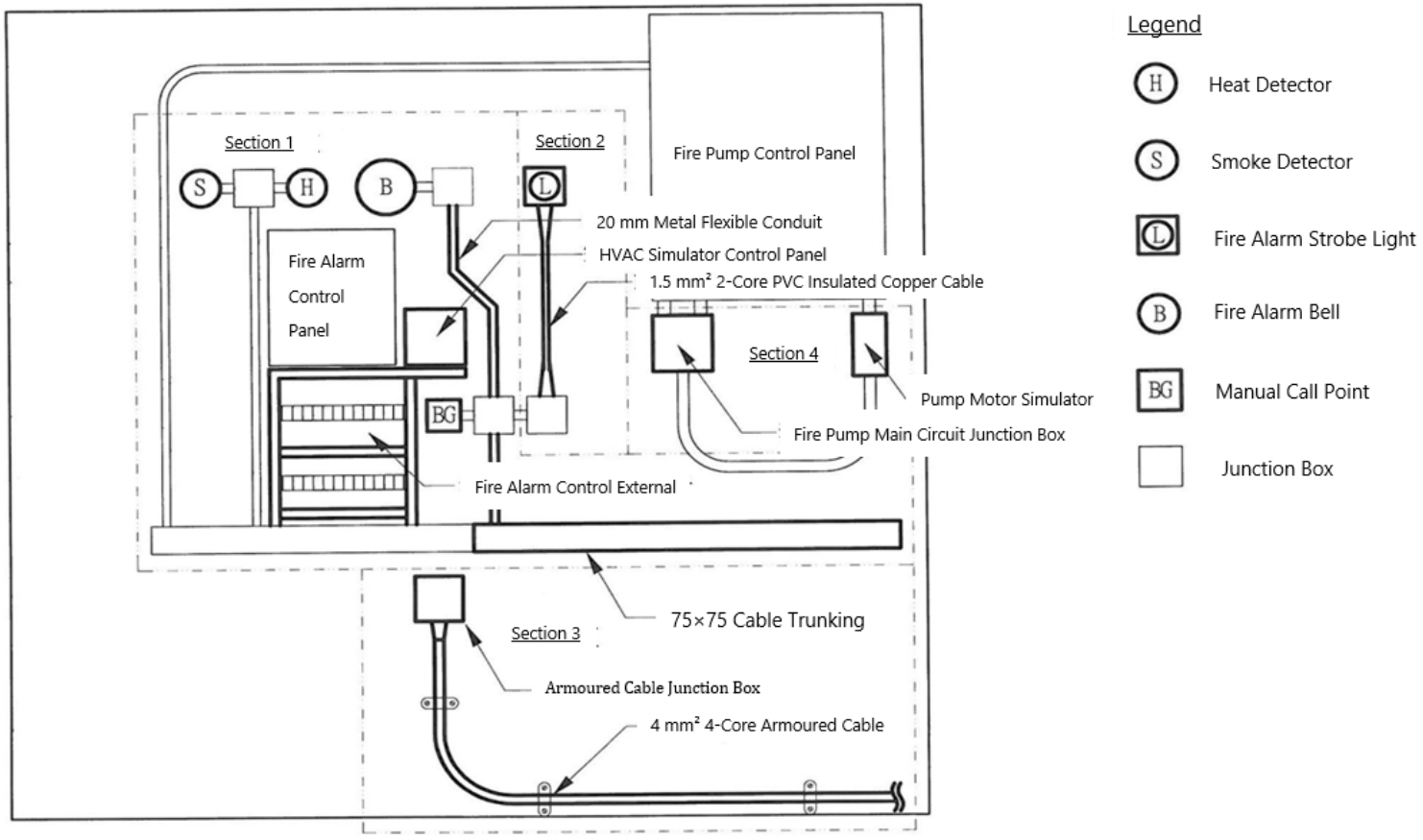
Working Drawing (5)



Note: Thick lines indicate the installation, cable pulling and wiring portions for the practical skills test.

Note :

① Drawing not to scale

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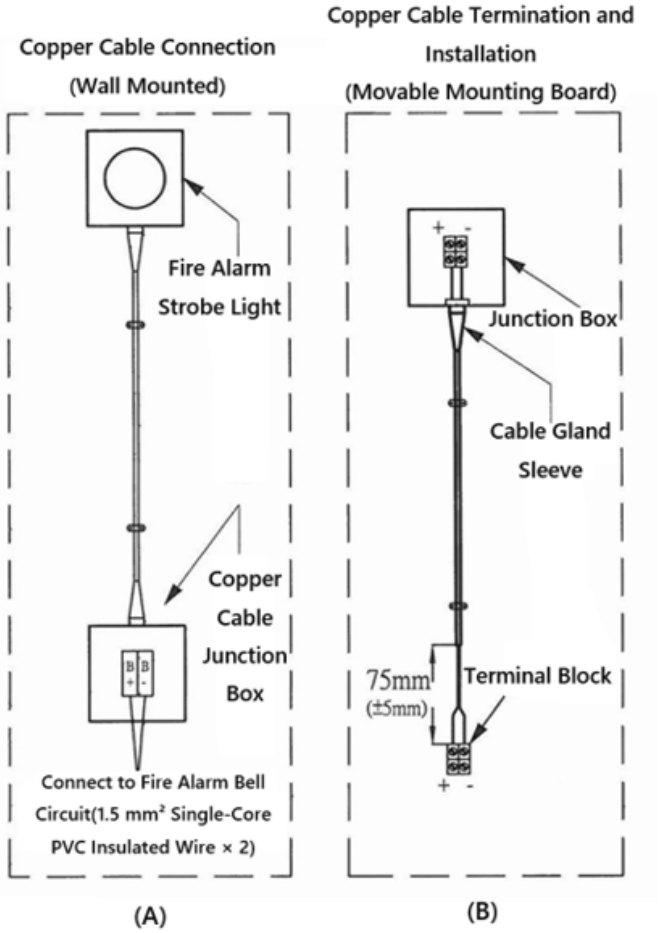
Working Drawing (6)



Note :

① Drawing not to scale

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Working Drawing (7)

Part 3 - Armoured Cable Installation

Requirements

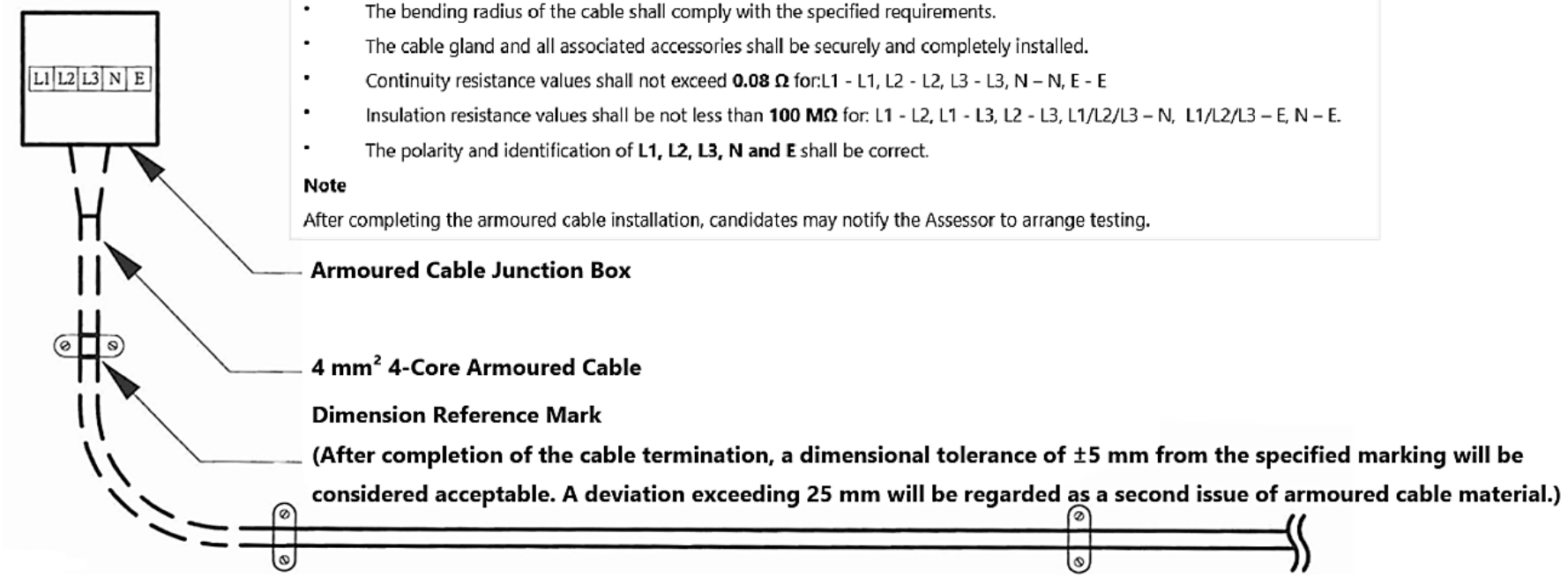
Install the armoured cable in accordance with the dimensions specified in the drawing. Complete the cable gland termination and associated accessories, and connect the conductors to the corresponding terminals **L1, L2, L3, N and E** in the armoured cable junction box.

Testing Criteria

- The bending radius of the cable shall comply with the specified requirements.
- The cable gland and all associated accessories shall be securely and completely installed.
- Continuity resistance values shall not exceed **0.08 Ω** for:L1 - L1, L2 - L2, L3 - L3, N – N, E - E
- Insulation resistance values shall be not less than **100 MΩ** for: L1 - L2, L1 - L3, L2 - L3, L1/L2/L3 – N, L1/L2/L3 – E, N – E.
- The polarity and identification of **L1, L2, L3, N and E** shall be correct.

Note

After completing the armoured cable installation, candidates may notify the Assessor to arrange testing.



Note :

① Drawing not to scale

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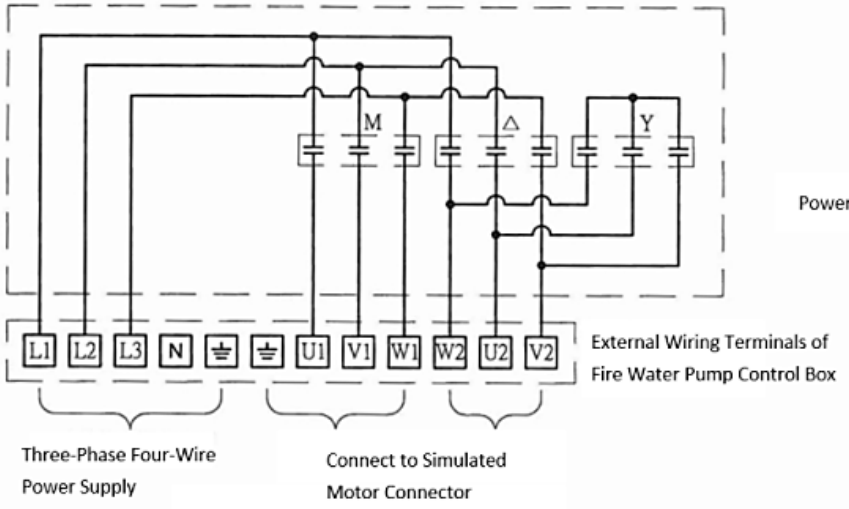
Working Drawing (8)



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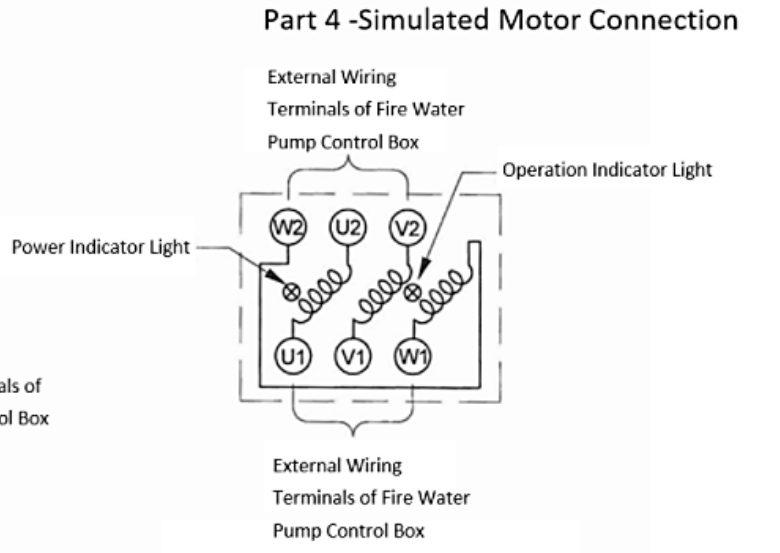

Terminal Arrangement Diagram of Simulated Motor Connector

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Testing Standards:

The three-phase power supply is connected correctly, and the yellow power normal indicator light is on.
The simulated motor connector is connected correctly (phase sequence must be in order), and the green operation indicator light is on.

Note :

① Drawing not to scale

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Notes to Candidate

1. Candidates should read the test papers carefully and ask the invigilator for any queries.
2. The practical test making scheme is based on the following criteria:
   a. Understanding of drawing and specification
   b. Preparation work before commencement of test
   c. Working procedures, accuracy and quality of work
   d. Proper handling and use of materials
   e. Proper use of tools and equipment
   f. Housekeeping after completion of test
   g. Safety precautions
3. Candidates should study the drawings and specifications attached to the test paper, if any, before the test begins.
4. Candidates should carry out the test according to test papers, working drawings and specifications provided.
5. Candidates should bring their own safety shoes and appropriate workwear, other safety equipment will be provided by HKCITTC. Candidates must take all necessary safety precautions to ensure work safety.
6. All tools and materials required by the test will be provided by HKCITTC, candidates should check and ensure their adequacy and quality. All the tools must be returned to HKCITTC after the test. The candidates may ask the invigilator for any problems.
7. Candidates are required to handle and move the tools and materials for use in the test, and to carry out associated work.
8. All candidates must stop when time is up.
9. Candidates are required to return the test paper to invigilator after the test.
10. Invigilators will take record photos periodically during the test.
11. Candidates are not allowed to take any photo or video with cameras or mobile phones.
12. Candidates are not allowed to use their mobile phones during the trade tests, except for in an emergency.
13. Offering bribes to an invigilator is an offence in law and HKCITTC will report to the ICAC for any such case.
14. Subject to certain situations and/or conditions of the date of event, trade tests/courses could be at any moment suspended or postponed at discretion of the invigilators. Examples of such situation/condition could be, but not limited to, (a) sudden operation disruptions to classrooms, test venues, test equipment or tools etc. due to unforeseeable mishaps; (b) sickness or injury of candidates, students or elated staff of the HKCITTC; (c) adverse weather conditions. HKCITTC will rearrange another appointment, for free, with the candidates/students affected. Whilst every effort is made to ensure the smooth running of trade test/courses, the HKCITTC will not resume any liability any loss/damage directly or indirectly related to such arrangement.

In the event that the candidate fails to take any necessary safety precautions and / or works in any dangerous situations, he / she will be deemed failed.

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