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

Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control) Trade Test Practical Test Mock Paper

(Version：EAE-PM-EN-02)

此文件關於空調製冷設備技工（電力控制）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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Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control) Trade Test Practical Test Mock Paper

Title: Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control)

Skill level: Skilled Worker

Test Requirements and Duration:

Procedures and requirements	Duration
1. <u>Dynamic risk assessment prior to work</u> 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. <u>Preparation prior to work and protection to work site</u> 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. <u>Practical Test</u> 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. Wire colour identification test** **2. Installation of fan coil unit control circuit** i. Fabricate and install lighting conduit A in accordance with Drawing (1). ii. Connect the control circuit for the fan coil unit, three-speed temperature switch and two-way motorized valve in accordance with Drawings (1) to (3). iii. Circuit identification numbers shall be attached to both ends of the control wiring. iv. Connect the system power supply and protective earthing conductor. (It is not necessary to replace all junction box covers, to facilitate inspection by the invigilator.) v. The following procedures must be notified to the invigilator for on-site verification before they may be carried out.	3 hours

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Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control) Trade Test Practical Test Mock Paper (Con't)

Test Requirements and Duration (con't):

Procedures and requirements	Duration
Test Content (Con't) **2. Installation of fan coil unit control circuit (con't)** v. Test with a multimeter to determine whether it is suitable to energize, and complete the test form. vi. After approval by the assessors, energize the system for operational testing and complete the test form. **3. Installation of air-handing unit control circuit** i. Connect the air handling unit control circuit in accordance with Drawings (4) and (5), including: a. motor control circuit and power supply circuit; b. electric heater and fan motor interlock control circuit; c. electric heater overheat trip control circuit; d. fire ventilation / air-conditioning control (VAC Control) circuit; e. fan (electric heater) time-delay shut-off control circuit; f. control circuits for various electrical control components. ii. Circuit identification numbers shall be attached to both ends of the control wiring. iii. Circuit identification numbers shall be attached to both ends of the control wiring iv. Adjust the setting of the motor overload protector. v. Properly replace all junction box covers. vi. The following procedures must be notified to the invigilator for on-site verification before they may be carried out: vii. Upon completion, test with an insulation tester and a multimeter to determine whether it is suitable to energize, and complete the test form. viii. After approval by the assessors, energize the system for operational testing and complete the test form.	Refer to previous page

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Refrigeration / Air-conditioning / Ventilation Mechanic (Electrical Control) Trade Test Practical Test Mock Paper (Con't)

Test Requirements and Duration (con't):

Procedures and requirements	Duration
4 . **Housekeeping after work and final touch-up on work before handover** 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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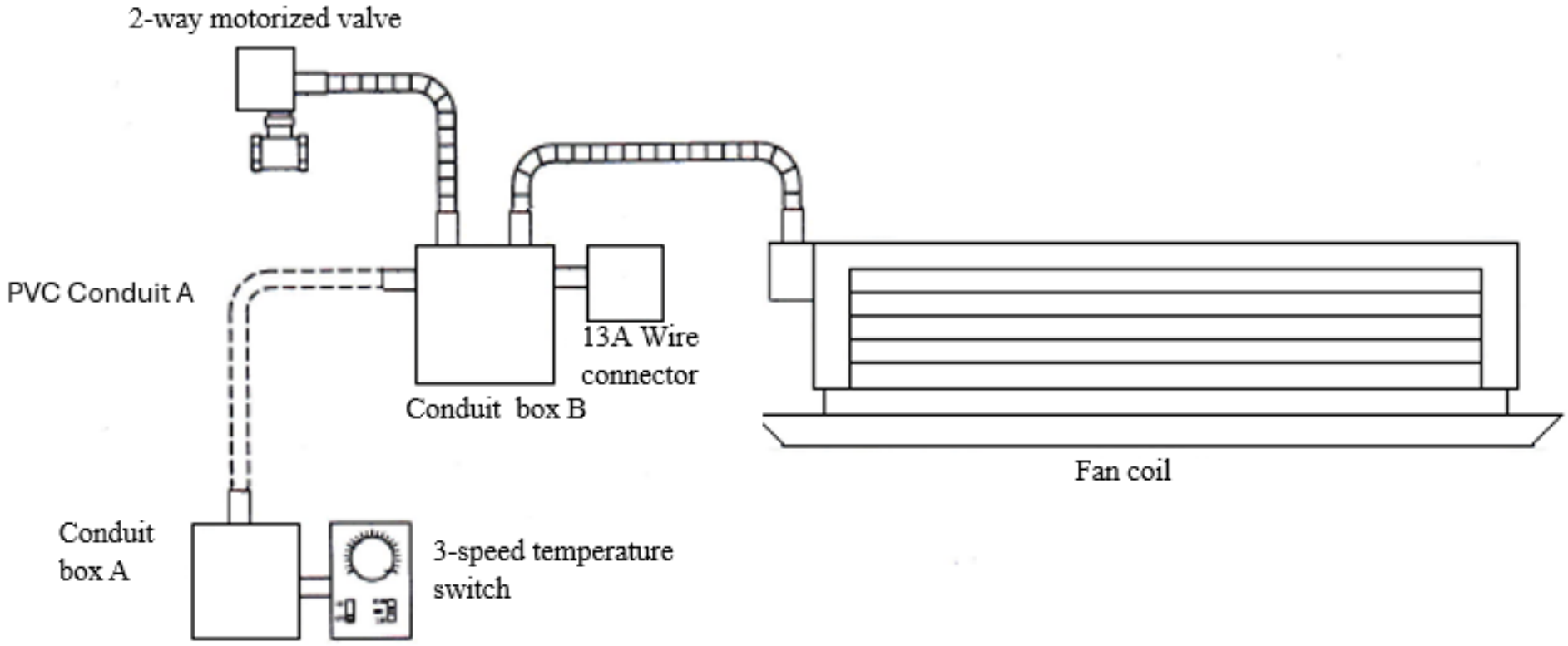
Working Drawing (1)
power system for fan coil



Note :
① Drawing not to scale

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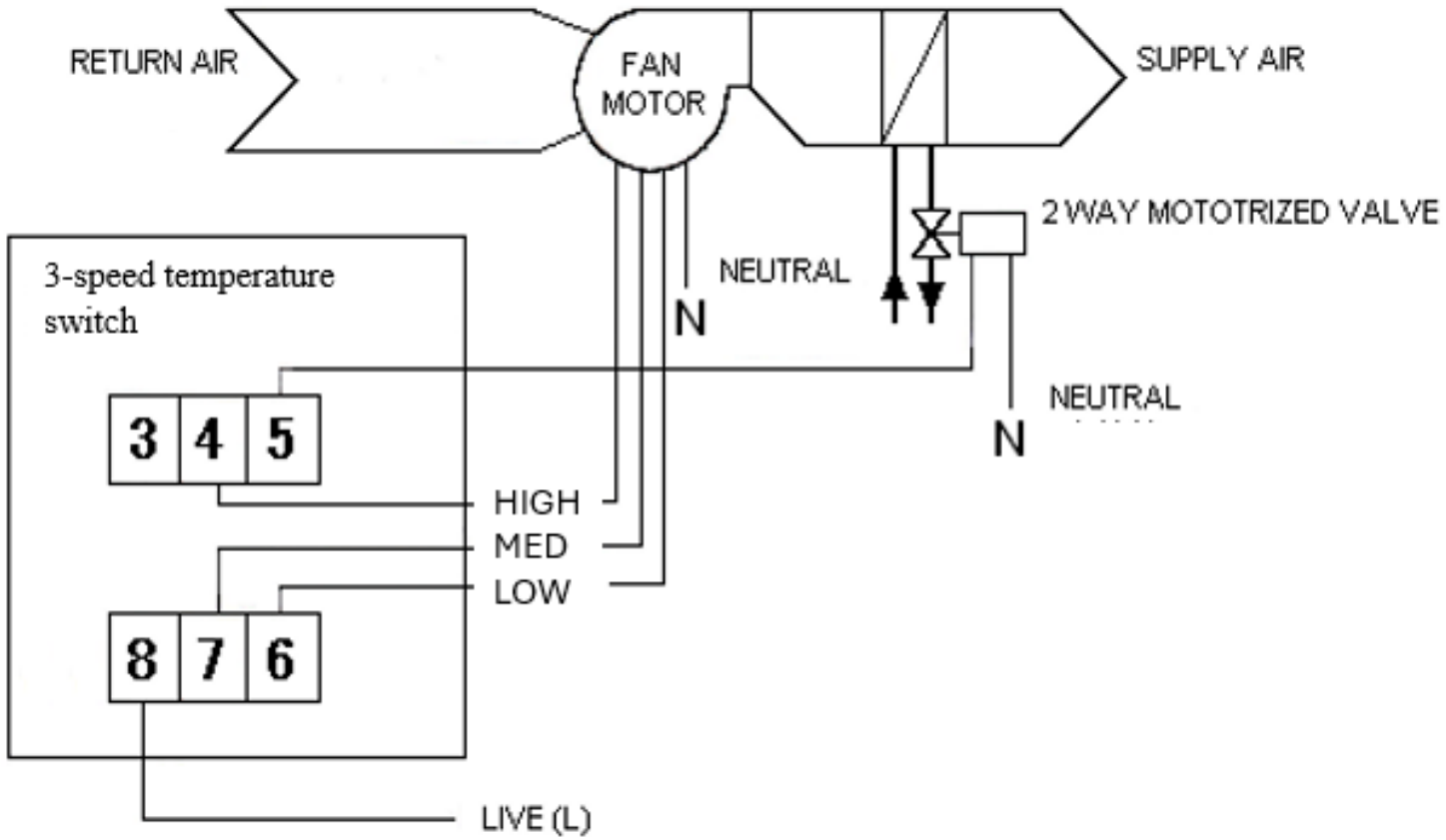
Working Drawing (2)
Electricity wiring diagram of 3-speed temperature



Note :
① Drawing not to scale

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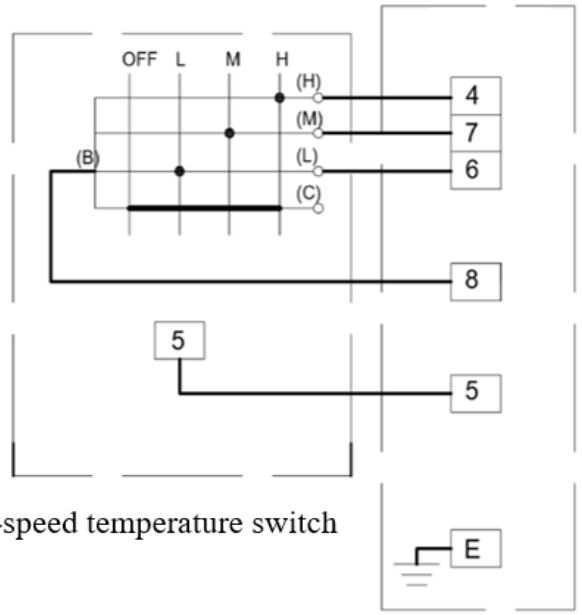
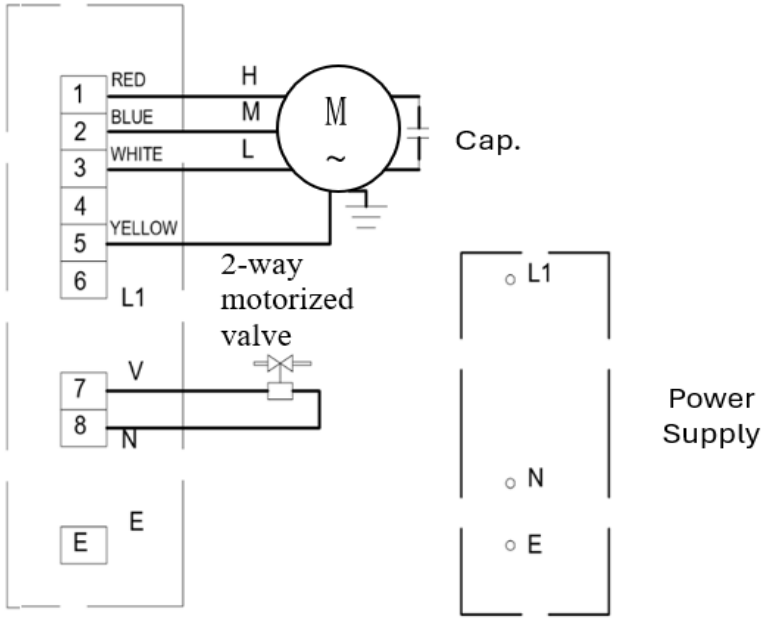
Working Drawing (3)

Conduit box A



3-speed temperature switch

Conduit box B



Note :

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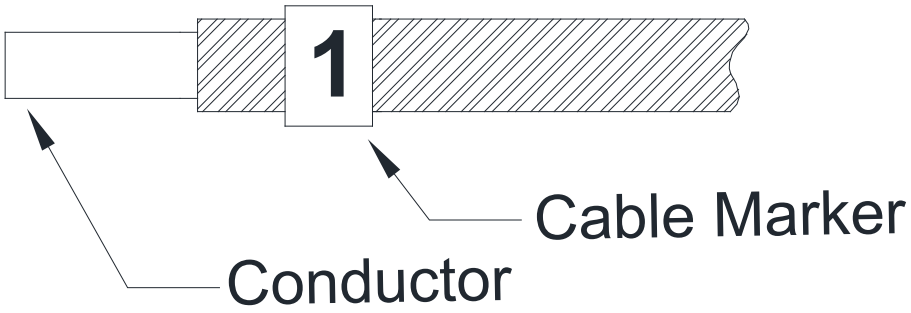
Circuit identification number Sample



Circuit identification number information

Description	Identification numbers
HIGH	H
MED	M
LOW	L
PHASE	L1
NEUTRAL	N
2-WAY MOTORIZED VALVE	V
EARTHING	E

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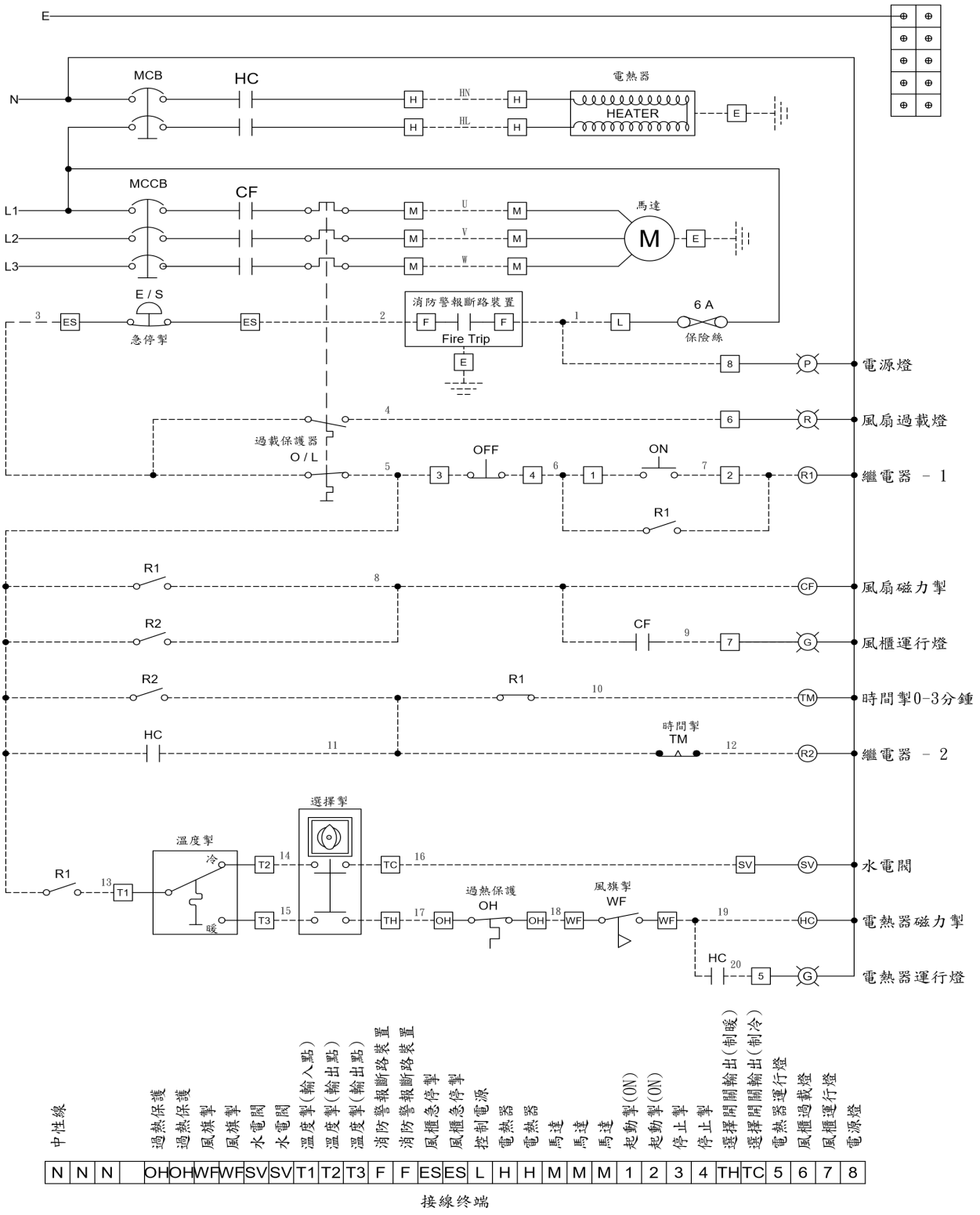
Working Drawing (4)



中性線				過熱保護	過熱保護	風旗掣	風旗掣	水電閥	水電閥	溫度掣(輸入點)	溫度掣(輸出點)	溫度掣(輸出點)	消防警報斷路裝置	消防警報斷路裝置	風櫃急停掣	風櫃急停掣	控制電源	電熱器	電熱器	馬達	馬達	馬達	起動掣(ON)	起動掣(ON)	停止掣	停止掣	選擇開關輸出(制暖)	選擇開關輸出(制冷)	電熱器運行燈	風櫃過載燈	風櫃運行燈	電源燈
N	N	N		OH	OH	WF	WF	SV	SV	T1	T2	T3	F	F	ES	ES	L	H	H	M	M	M	1	2	3	4	TH	TC	5	6	7	8

接線終端

Note :

① Drawing not to scale

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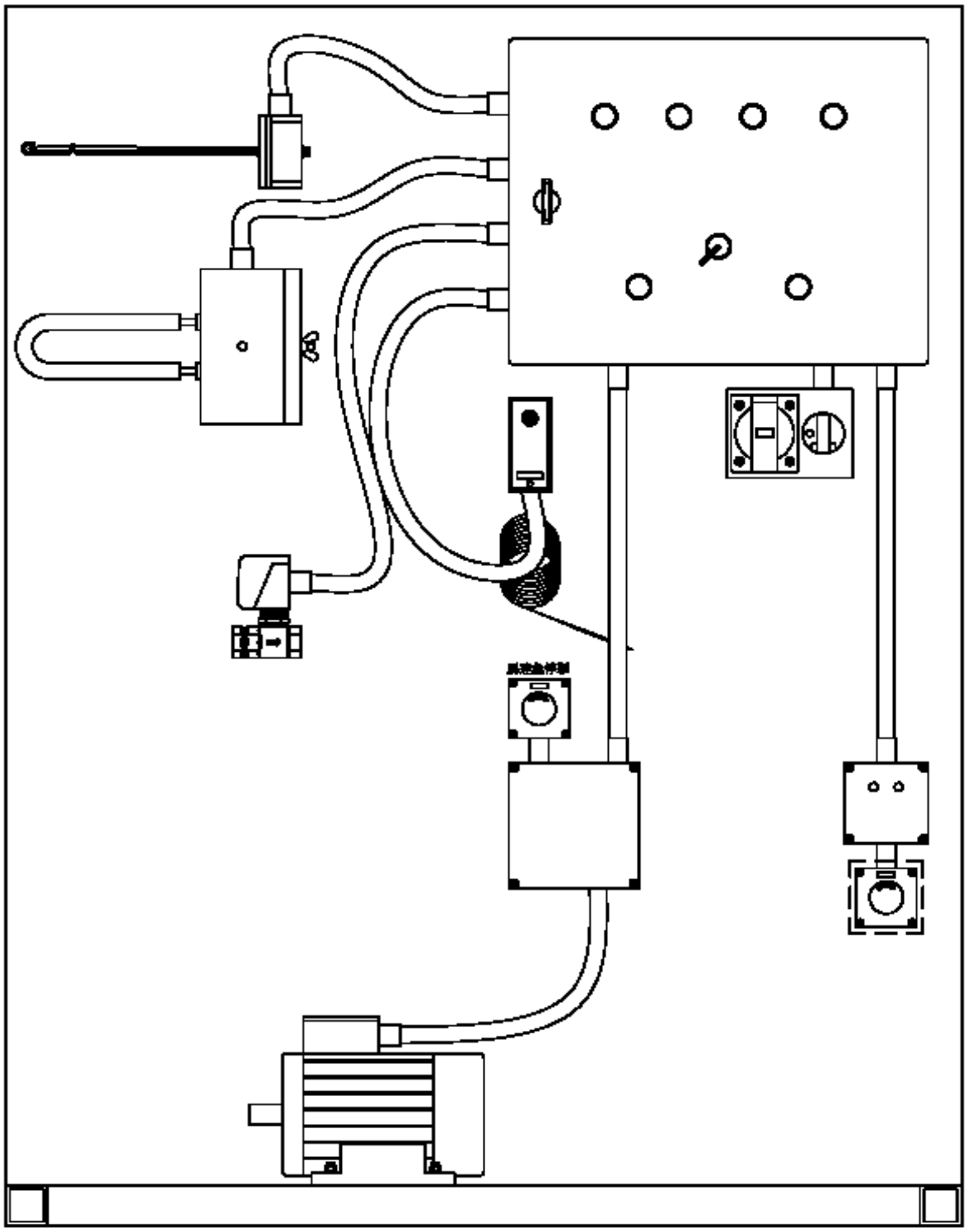
Working Drawing (5)
Installation of Fan Coil Unit Control Circuit



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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