221116
中国 江苏省 徐州市
铜山经济开发区黄山路1号
江苏省精创电气股份有限公司
kaiqiang ma

kaiqiang ma
Jiangsu Jingchuang Electronics Co Ltd
1 Huangshan Rd. Tongshan
Economic Development Zone
Xuzhou
Jiangsu 221116 CHINA

Date: 2017/01/19
Subscriber: None
PartySite: 1529169
File No: SA44563
Project No: 4787333464
PD No: 17M02344
Type: R
PO Number: AMY MENG, 1/29/2016

Subject: **Initial Production Inspection**

PLEASE NOTE: YOU ARE NOT AUTHORIZED TO SHIP ANY PRODUCTS BEARING ANY UL MARKS UNTIL THE INITIAL PRODUCTION INSPECTION HAS BEEN SUCCESSFULLY CONDUCTED BY THE UL FIELD REPRESENTATIVE.

An Initial Production Inspection (IPI) is an inspection that must be conducted prior to the first shipment of products bearing the UL Mark. This is to ensure that products being manufactured are in accordance with UL's requirements including the Follow-Up Service Procedure. After the UL Representative has verified compliance of your product(s), authorization will be granted for shipment of product(s) bearing the appropriate UL Marks as denoted in the Procedure.

Inspections at your plant will be conducted under the supervision of Mr. QIU KAIFAN, UL INSPECTION CENTER DONGGUAN, CHINA NAT' IMPORT & EXP COM INSP CORP, 6 LI CHENG RD, ZHONGCHANG BLDG, 5TH FL, CHANG PING TOWN, DONGGUAN, GUANGDONG, China, 523565., PHONE: 769-8381-7010, FAX: 769-8381-7017, EMAIL: ulic213@ccicgd.com

Marks as needed may be obtained from UL LABEL CENTER GUANGZHOU, ROOM 3006-3007, TIMES PROPERTY CENTER, NO 410 DONGFENG RD MIDDLE, GUANGZHOU, GUANGDONG, China, 510030. PHONE: 208-348-7088, FAX: 208-348-7088, EMAIL: LABELCENTER.GUZ@UL.COM, ATTN: T WEN

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

Please review this material and report any inaccuracies to UL's Customer Service Professionals. Contact information for all of UL's global offices can be found at http://ul.com/aboutul/locations.

If you'd like to receive updated materials FASTER, UL offers electronic access and/or delivery of this material. For more details, contact UL's Customer Service Professionals as shown above., referring to the above Project and/or PD Numbers.

This material is provided on behalf of UL LLC(UL) or any authorized licensee of UL.

SCL File

UL INSPECTION CENTER 213

Production Date: UNKNOWN
Contact: Mr. Ma Kaiqiang
Phone: 86 0516-87366018
EMail: mkqsy02@163.com

ADDENDUM TO TRANSMITTAL LETTER

kaiqiang ma
Jiangsu Jingchuang Electronics Co Ltd
1 Huangshan Rd. Tongshan
Economic Development Zone
Xuzhou
Jiangsu 221116 CHINA

Date: 2017/01/19
Subscriber: None
PartySite: 1529169
File No: SA44563
Project No: 4787333464
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Subject: **Initial Production Inspection**

The following material resulting from the investigation under the above numbers is enclosed.

Issue Date	Vol	Sec	Pages	Revised Date
2017/01/13	1	1	Add New Volume	

Follow-Up Service Procedure

DO NOT DISCARD THIS PAGE

It is important to keep UL Procedures and Test Reports up-to-date as new or revised pages are received.
Correct maintenance will decrease the amount of time the UL Representative spends when visiting your facility.

UL LLC offers MyHome @UL, a dedicated website providing secure access to online tools and databases that can help simplify your compliance activities. You can customize your personal MyHome @UL page to include the content needed most, including timely information about certification updates and links to other Web sites you visit regularly. Visit http://my.home.ul.com/ to sign up today!

PAGES (in content order)	FUNCTION	HOW TO UPDATE
Authorization Page	Displays the Product Category, the type of Follow-Up Service (Type R=Reexamination / Type L=Label), the File Number and the Volume Number associated with each Applicant's, Manufacturer's and Listee's company name and address.	Replace existing page by matching the UL File Number and Volume Number. Discard the older page (refer to "Issued" or "Revised" date).
Addendum to Authorization Page*	Lists the additional names and addresses of manufacturing locations, when multiple locations exist	Replace existing page by matching the UL File Number and Volume Number. Discard the older page (refer to "Issued" or "Revised" date).
Listing Mark Data (LMD), Classification Mark Data (CMD) or Recognized Component Mark Data (RCMD) Pages*#	Used only for products covered under Type R Service. Displays the correct LMD, CMD, or RCMD Mark, the Control Number for Listed and Classified categories and additional information regarding minimum size, application, procurement, and any other optional markings, in addition to the UL Mark.	Replace existing page by matching the UL File Number and Volume Number. Discard the older page (refer to "Issued" or "Revised" date).
Multiple Listing (ML) Correlation Sheet*	Correlates product model numbers between those products made by a Manufacturer for the Basic Applicant and those supplied to another company, the Multiple Listee.	Replace, add or delete page(s) with most current "Issued" or "Revised" date.
Index*	Catalogs the contents of the Procedure by some logical means, i.e. Section Number, Report Reference Number, or Issue Date.	Replace present page by matching the UL File Number, Volume Number, Page Number and most current "Revised" date.
Appendices (App.)*#	Contains instructions for the Manufacturer and UL Representative concerning specific responsibilities and required periodic tests. May also outline tests to be conducted on samples to be forwarded to UL's facilities.	Replace present page by matching the UL File Number, Volume Number, Appendix letter (eg. App. A), Page Number and most current "Revised" date.
	Standardized Appendix Pages are the same for all manufacturers within a particular product category.	Replace present page by matching the Appendix letter (eg. App. A), Page Number and most current "Revised" date.
Follow-Up Inspection Instructions (FUII) Pages*	Contains information similar to that in the Appendices. FUII Pages are issued as part of the Procedure when a UL Standard is used in conjunction with the Procedure, and are the same for all manufacturers within a particular category.	Replace present pages by matching the Page Number and most current "Issued" or "Revised" date.
Section General (Sec. Gen.)*#	Contains description, requirements, identifications and/or specifications that are common to all products covered by the entire volume and supplements the information provided in the Description Section.	Replace present page by matching the UL File Number, Volume Number, Page Number and most current "Revised" date.
Description, or Section (Sec.)*	Contains the specific description of one or more products or systems. This includes written text supplemented by photographs, drawings, etc., as necessary, to define features that affect compliance with the applicable requirements.	Replace present page by matching the UL File Number, Volume Number, Section Number, Page Number and most current "Issued" date.

***** The above page(s) may not appear in all UL Follow-Up Service Procedures; UL's Conformity Assessment Services staff determines their inclusion.
# These pages are combined in the **Generic Inspection Instructions** for International Style Reports, identified, as example by Vol. X1, X2, etc.

PLEASE NOTIFY YOUR LOCAL UL OFFICE OF ANY CHANGES IN CONTACT NAME, COMPANY NAME OR ADDRESS, SO THIS MATERIAL AND IMPORTANT INFORMATION CONTINUES TO BE DELIVERED TO YOUR FACILITY WITHOUT INTERRUPTION.

FOLLOW-UP SERVICE PROCEDURE
(TYPE R)

COMPONENT - CONTROLLERS, REFRIGERATION
(SDFY2,SDFY8)

Manufacturer: SEE ADDENDUM FOR MANUFACTURER LOCATIONS

Applicant: 1544885 (Party Site)
Elitech Technology Inc
508 Topham Ct
Milpitas CA 95035

Recognized Company: 1544885 (Party Site)
SAME AS APPLICANT

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting Party, only on products when constructed, tested and found to be in compliance with the requirements of this Follow-Up Service Procedure and in accordance with the terms of the applicable service agreement with UL Contracting Party and any applicable Service Terms. The UL Contracting Party for Follow-Up Services is listed on addendum to this Follow-Up Service Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly herein as "UL."

UL further defines responsibilities, duties and requirements for both Manufacturers and UL representatives in the document titled, "UL Mark Surveillance Requirements" that can be located at the following web-site: http://www.ul.com/fus and in the document titled "UL and Subscriber Responsibilities" that can be located at the following website: http://www.ul.com/responsibilities. Manufacturers without Internet access may obtain the current version of these documents from their local UL customer service representative or UL field representative. For assistance, or to obtain a paper copy of these documents or the applicable Service Terms, please contact UL's Customer Service at http://ul.com/aboutul/locations/, select a location and enter your request, or call the number listed for that location.

The Applicant, the specified Manufacturer(s) and any Recognized Company in this Follow-Up Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If your applicable agreement is a Global Services Agreement ("GSA") with an effective date of January 1, 2012 or later and this Follow-Up Service Procedure is issued on or after that effective date, the Applicant, the specified Manufacturer(s) and any Recognized Company will be bound to a Service Agreement for Follow-Up Services upon the earliest by any Subscriber of use of the prescribed UL Mark, acceptance of the factory inspection, or payment of the Follow-Up Service fees which will incorporate such GSA, this Follow-Up Service Procedure and the Follow-Up Service Terms which can be accessed by clicking here: http://www.ul.com/contracts/Terms-After-12-31-2011. In all other events, Follow-Up Services will be governed by and incorporate the terms of your applicable service agreement and this Follow-Up Service Procedure.

It is the responsibility of the Recognized Company to make sure that only the products meeting the aforementioned requirements bear the authorized Marks of UL LLC, or any authorized licensee of UL LLC.

This Follow-Up Service Procedure contains information for the use of the above Manufacturer(s) and representatives of UL and is not to be used for any other purpose. It is provided to the Manufacturer with the understanding that it will be returned upon request and is not to be copied in whole or in part.

This Follow-Up Service Procedure, and any subsequent revisions, is the property of UL and is not transferable. This Follow-Up Service Procedure contains confidential information for use only by the above named Manufacturer(s) and representatives of UL and is not to be used for any other purpose. It is provided to the Subscribers with the understanding that it is not to be copied, either wholly or in part unless specifically allowed, and that it will be returned to UL, upon request.

Capitalized terms used but not defined herein have the meanings set forth in the GSA and the applicable Service Terms or any other applicable UL service agreement.

UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages arising out of or in connection with the use or reliance upon this Follow-Up Service Procedure to anyone other than the above Manufacturer(s) as provided in the agreement between UL LLC or an authorized licensee of UL LLC, including UL Contracting Party, and the Manufacturer(s).

UL LLC has signed below solely in its capacity as the accredited entity to indicate that this Follow-Up Service Procedure is in compliance with the accreditation requirements.

Bruce A. Mahrenholz
Director
North American Certification Program

LOCATION

1529169 (Party Site)
Jiangsu Jingchuang Electronics Co Ltd
1 Huangshan Rd. Tongshan
Economic Development Zone
Xuzhou
Jiangsu 221116 CHINA
Factory ID: None
UL Contracting Party for above site is: UL AG

Recognized Component Marking Data Page (RCMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

RECOGNIZED COMPONENT MARKING

Products Recognized under UL's Component Recognition Service are identified by marking elements consisting of:

1. The Recognized Company's identification specified in this document.

2. A catalog, model or other applicable product designation specified in the descriptive sections of this document.

3. The UL Recognized Component Mark shown below is optional unless required elsewhere in the Procedure.

Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program. The UL Listing or Classification Mark is not authorized for use on or in connection with Recognized Components.

Recognized Component Mark

Minimum size of the Recognized Component Mark is not specified as long as it is legible. Minimum height of the registered symbol ® shall be 3/64 inch but may be omitted if it is out of proportion to the Recognized Component Mark or not legible to the naked eye.

The manufacturer may reproduce the Mark electronically. Any decision regarding the acceptability of the manufacturer's Mark reproduction will be made at the Reviewing Office.

Recognized Component Marking Data Page (RCMDP)

(FILE IMMEDIATELY AFTER AUTHORIZATION PAGE)

RECOGNIZED COMPONENT MARKING

Products Recognized under UL's Component Recognition Service are identified by marking elements consisting of:

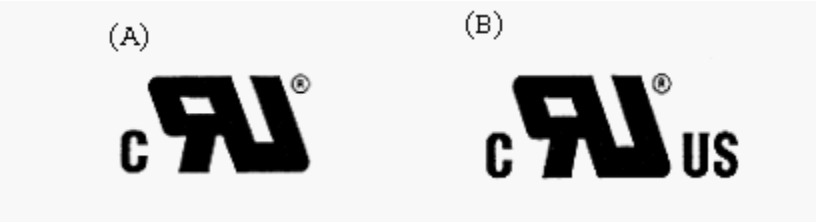
1. The Recognized Company's identification specified in this document.

2. A catalog, model or other applicable product designation specified in the descriptive sections of this document.

3. The UL Recognized Component Mark shown below:
   (A) Recognized only to Canadian safety requirements, or;
   (B) Recognized to both U.S. and Canadian safety requirements.

Only those components, which actually bear the Marking, should be considered as being covered under the Recognition Program. The UL Listing or Classification Mark is not authorized for use on or in connection with Recognized Components.

Recognized Component Mark



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INDEX

+ - CNR - Canadian Standards - Recognized
USR - United States Standards - Recognized

GENERAL

PRODUCT COVERED:

Refrigeration Controls

GENERAL CONSTRUCTION:

Tolerances - Unless specified otherwise, all indicated dimensions are nominal.

Mechanical Electrical Connections - For electrical connection, internal wiring and leads of components are provided with crimp-on terminals such as closed loop, spade type with upturned ends, quick connect with integral detent or locking type, or are mechanically secured and soldered.

Corrosion Protection - All parts of these devices are either constructed of corrosion resistant material or are plated or painted for protection against corrosion. Where corrosion protection is specified, all surfaces of the part are so protected, unless otherwise specified.

Dimensions - All dimensions are nominal unless otherwise specified.

Soldered Connections - All soldered connections are made mechanically secure before soldering. When hand soldered, leads on printed circuit boards are bent over prior to soldering.

Exception - Printed circuit board assemblies that are wave soldered.

Wiring - Unless otherwise indicated all wiring has copper conductors.

QUICK CONNECT TERMINALS:

General - This description supersedes any other descriptions of quick connect terminals in the following sections. All "female-type" or envelope quick connect terminals are either Listed or Recognized Component (RFWV2). All quick connect tab terminals employed in line voltage circuits are either (1) Listed or Recognized quick connect terminals (RFWV or RFWV2), or (2) comply with the following description.

Material - Shall be: (1) plated or unplated copper alloy (e.g. brass), (2) plated steel, (3) unplated steel of a corrosion-resistant alloy, or (4) brass.

Dimensions - Dimensions of all quick-connect tabs are specified below in Table 1 and Figs. 1A and 1B.

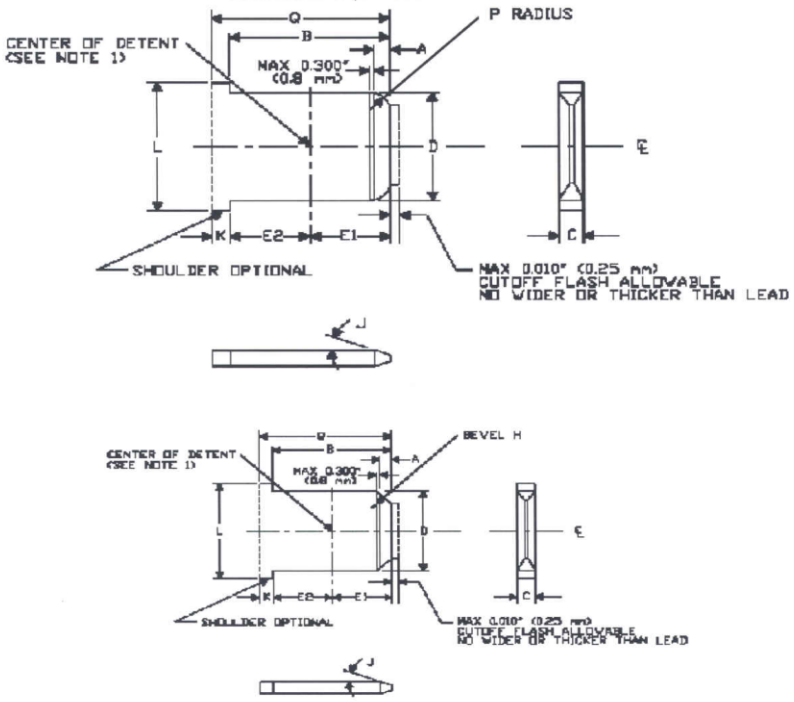
Table 1 - Dimensions of production and test tabs in inches

Nominal Size	A	B(min)	C	D	E1	E2	F	J	M	N	P	Q(min)
0.187 x 0.020 with dimple	0.035 0.024	0.244	0.021 0.019	0.190 0.181	0.110 0.091	0.153 0.147	0.060 0.050	12° 8 °	0.067 0.055	0.059 0.047	0.067 0.024	0.287
0.187 x 0.020 with hole	0.035 0.024	0.244	0.021 0.019	0.193 0.184	0.134 0.117	0.128 0.122	0.060 0.050	12° 8 °			0.067 0.024	0.287
0.205 x 0.032 with dimple	0.040 0.027	0.244	0.033 0.030	0.210 0.201	0.110 0.091	0.153 0.147	0.075 0.063	12° 8 °	0.098 0.086	0.080 0.070	0.071 0.027	0.287
0.205 x 0.032 with hole	0.040 0.027	0.244	0.033 0.030	0.210 0.201	0.134 0.117	0.128 0.122	0.075 0.063	12° 8 °			0.071 0.027	0.287
0.205 x 0.032 with dimple	0.040 0.027	0.307	0.033 0.030	0.253 0.244	0.161 0.142	0.163 0.157	0.080 0.063	12° 8 °	0.098 0.086	0.080 0.070	0.071 0.027	0.350
0.205 x 0.032 with hole	0.040 0.027	0.307	0.033 0.030	0.253 0.244	0.186 0.169	0.137 0.131	0.080 0.063	12° 8 °			0.071 0.027	0.350

Dimensions of metric production and test tabs in millimeters

Nominal Size	A	B(min)	C	D	E1	E2	F	J	M	N	P	Q(min)
4.8 x 0.5 with dimple	0.9 0.6	6.2	0.54 0.47	4.80 4.60	2.8 2.3	3.89 3.73	1.5 1.3	12° 8 °	1.7 1.4	1.5 1.2	1.7 0.6	7.3
4.8 x 0.5 with hole	0.9 0.6	6.2	0.54 0.47	4.90 4.67	3.4 3.0	3.25 3.10	1.5 1.3	12° 8 °			1.7 0.6	7.3
5.2 x 0.8 with dimple	1.0 0.7	6.2	0.84 0.77	5.30 5.10	2.8 2.3	3.89 3.73	1.9 1.6	12° 8 °	2.5 2.2	2.0 1.8	1.8 0.7	7.3
5.2 x 0.8 with hole	1.0 0.7	6.2	0.84 0.77	5.30 5.10	3.4 3.0	3.25 3.10	1.9 1.6	12° 8 °			1.8 0.7	7.3
6.3 x 0.8 with dimple	1.0 0.7	7.8	0.84 0.77	6.40 6.20	4.1 3.6	4.14 3.99	2.0 1.6	12° 8 °	2.5 2.2	2.0 1.8	1.8 0.7	8.9
6.3 x 0.8 with hole	1.0 0.5	7.8	0.84 0.77	6.40 6.20	4.7 4.3	3.48 3.33	2.0 1.6	12° 8 °			1.8 0.7	8.9

Figure 1A
Dimensions of production and test tabs



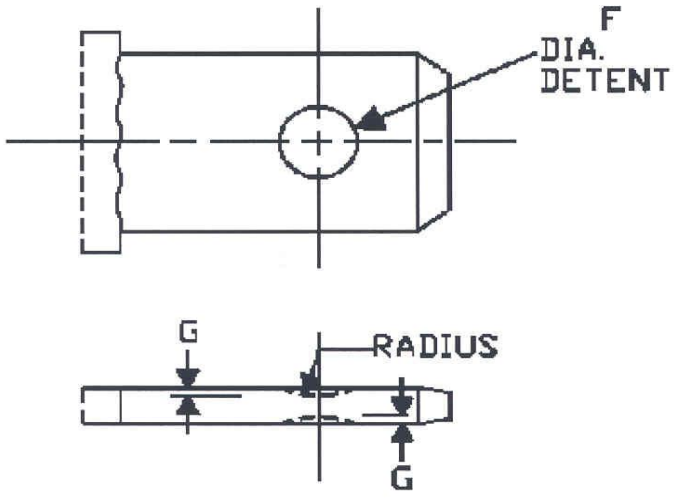
Note 1 – For detent and hole dimensions F, G, M, and N see Figure 1B

Note 2 – Bevel "H" need not be a straight line if it is within the confines shown, or it may be a radius of "P".

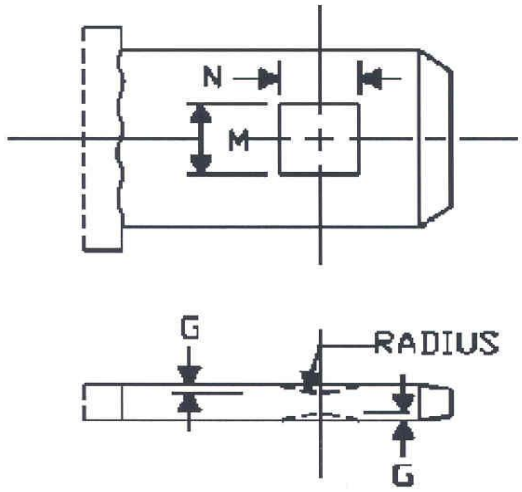
Note 3 – "Q" dimension is for tabs without shoulders.

Note 4 – "L" dimensions not specified.

Figure 1B
Dimensions of dimple detents



- OR -



Test Report issued under the responsibility of:

TEST REPORT
UL 60730-1, CAN/CSA-E60730-1
Automatic electrical controls for household and similar use

File Number.....:	**SA44563**
Project Number. .....:	4787333464
Date of issue.....:	2017-01-13
Applicant's name .....:	**Elitech Technology Inc.**
Address.....:	**508 Topham Ct., Milpitas, CA 95035**
Test specification:	
Standard.....:	UL 60730-1 UL 60730-2-9 CAN/CSA -E60730-1 CAN/CSA -E60730-2-9
Test procedure .....:	UL/cUL Recognition
Non-standard test method.....:	N/A
Test Report Form No. .....:	Short Form – Based on IEC6730_1G
Test Report Form(s) Originator ....:	UL
Master TRF.....:	Dated 2011-04

Test item description .....:	Refrigeration Controllers
Trade Mark.....:	
Recognized Company Name.....:	Elitech Technology Inc.
Model/Type reference .....:	ECS180NEO Series and ECS2180NEO Series
Ratings .....:	See GPI for rating details

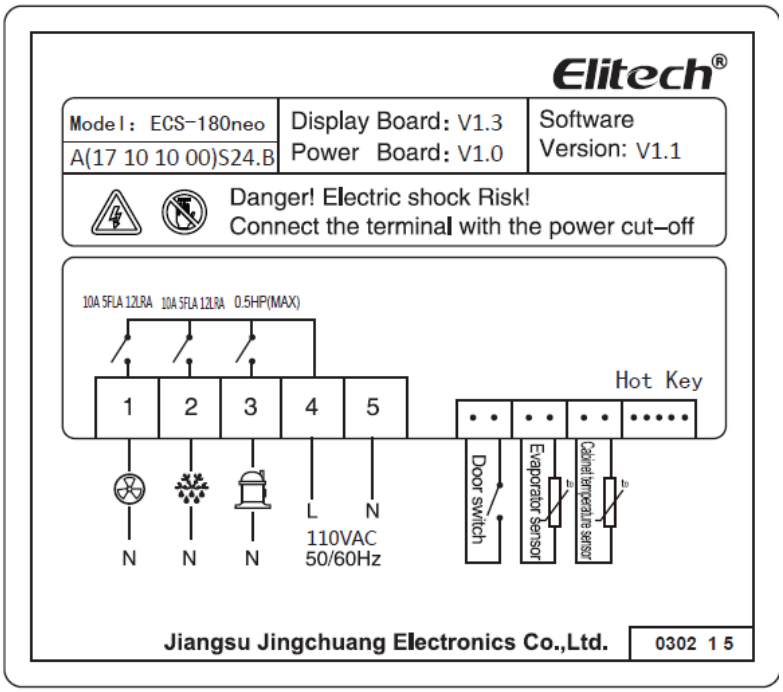
List of Attachments (including a total number of pages in each attachment):

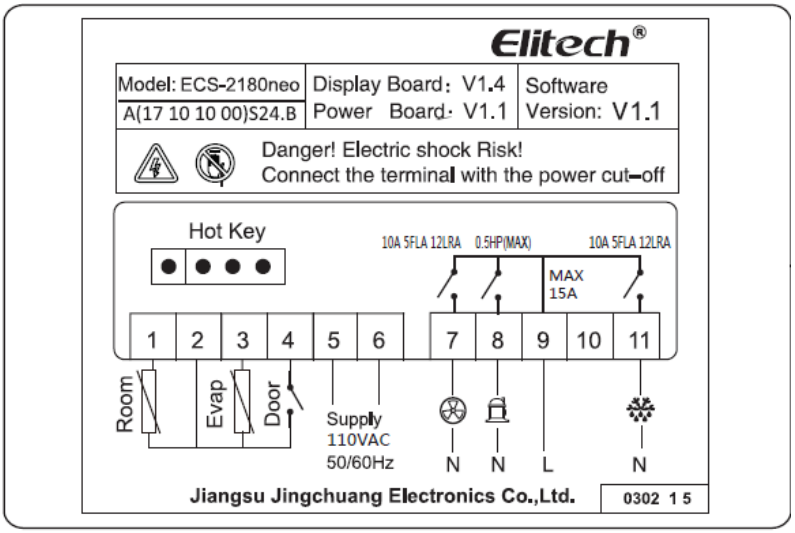
Enclosures		
Type	Supplement Id	Description
Figure	1	Overall View ECS180NEO
Figure	2	Overall View ECS180NEO
Figure	3	Internal View ECS180NEO
Figure	4	Internal View ECS180NEO
Figure	5	Overall View ECS2180NEO
Figure	6	Internal View ECS2180NEO
Illustration	1 and 2	Operating manual for each series

Summary of compliance with National Differences
List of countries addressed:

United States
Canada

Copy of marking plate (Example)





Markings:

All markings are Laser etched

The following markings are provided on the product:

Manufacture's name or Trademark,
Model Number;
Ratings in Volts, Frequency, Amps or Watts, and types of loads (Optional)
Operating Temperature Range (Optional)

Test item particulars :	
Operating ambient temperature ..... :	0°C to 50°C
Shipping and storage temperature ..... :	-25°C to 75°C
Control type ..... :	1.B
Software class ..... :	N/A
Overvoltage category ..... :	II
Pollution degree ..... :	2
Rated Impulse Voltage ..... :	1500
Maximum phase to ground voltage of the supply source ..... :	150
Protection against electric shock class ..... :	II
Environmental ..... :	0 C to 55 C Operating, -25 C to 75 C Storage
Classification of installation and use ..... :	Indoor
Supply Connection ..... :	AC
Operating frequency ..... :	50/60 Hz.

General remarks:

UL LLC authorizes the above named company to reproduce this Report either in its entirety or the portion of this Report consisting of all pages except for Spacings and Component Description Tables.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information:

These temperature controllers are intended for use in refrigeration applications such as low temperature cabinets, kitchen cabinets, wine cabinets etc. Models ECS-180neo and ECS-2180new are identical to each other except for electrical ratings and type of connections. Model ECS-180neo is provided with male quick connect terminals and Model ECS-2180neo is provided with terminal blocks.

For Model ECS-180neo Series:

INPUTS:

Input Type	Terminal	Rating
AC (Model 17.10.10.00)	4-5	120 V, 60 Hz
AC (Model 17.10.00.10)	4-5	120 V, 60 Hz
AC (Model 17.00.10.10)	4-5	120 V, 60 Hz
AC (Model 17.00.05.05)	5-6	120 V, 60 Hz
AC (Model 30.10.00.00)	5-6	120 V, 60 Hz
AC (Model 30.00.10.00)	5-6	120 V, 60 Hz
AC (Model 30.00.00.10)	5-6	120 V, 60 Hz

COMMUNICATION: Models A(17.10.10.00), A(17.10.00.10) and Model A(17.00.10.10)

Type/Function	Terminal	Rating
Room Temperature	1-2	--
Evaporator (Optional)	3-2	--
Door Switch (Optional)	2-4	--

COMMUNICATION: Models (17.10.05.05), A(30.10.00.00), A(30.00.10.00) and Model A(30.00.00.10)

Type/Function	Terminal	Rating
Room Temperature	1-2	--
Evaporator (Optional)	3-4	--
Door Switch ()	5-4	--

OUTPUTS(+): Models A(17.10.10.00), A(17.10.00.10) and Model A(17.00.10.10)

Output Terminals	Load Controlled	Switching Device and Schematic Ref	Electrical Ratings	Declaration
4-3	Compressor	K1	120 V, 0.5 HP	1.B
4-2	Heater	K2	120 V, 5 LRA, 12 LRA	1.B
4-1	Fan or Light	K3 or K4	120 V, 5 LRA, 12 LRA	1.B

OUTPUTS(+): Models A(17.10.05.05)

Output Terminals	Load Controlled	Switching Device and Schematic Ref	Electrical Ratings	Declaration
5-4	Compressor	K1	120 V, 0.5 HP	1.B
5-3	Heater	K2	120 V, 5 LRA, 12 LRA	1.B
5-2	Fan	K3	120 V, 1 LRA, 5 LRA	1.B
5-1	Light	K4	120 V, 1 LRA, 5 LRA	1.B

OUTPUTS(+): Models A(30.10.00.00), A(30.00.00.10) and Model A(30.00.10.00)

Output Terminals	Load Controlled	Switching Device and Schematic Ref	Electrical Ratings	Declaration
4-3	Compressor	K1	120 V, 1.0 HP	1.B
2-1	Heater, Fan or Light	K2	120 V, 5 LRA, 12 LRA	1.B

For Model ECS-2180neo Series:

INPUTS:

Input Type	Terminal	Rating
AC (Model 17.10.10.00)	5-6	120 V, 60 Hz
AC (Model 17.10.00.10)	5-6	120 V, 60 Hz
AC (Model 17.00.10.10)	5-6	120 V, 60 Hz
AC (Model 30.10.00.00)	6-7	120 V, 60 Hz
AC (Model 30.00.10.00)	6-7	120 V, 60 Hz
AC (Model 30.00.00.10)	6-7	120 V, 60 Hz

COMMUNICATION: Models A(17.10.10.00), A(17.10.00.10) and Model A(17.00.10.10)

Type/Function	Terminal	Rating
Room Temperature	1-2	--
Evaporator (Optional)	2-3	--
Door Switch ()	4-2	--

COMMUNICATION: Models A(30.10.00.00), A(30.00.10.00) and Model A(30.00.00.10)

Type/Function	Terminal	Rating
Room Temperature	1-2	--
Evaporator (Optional)	3-4	--
Door Switch ()	5-4	--

OUTPUTS(+): Models A(17.10.10.00), A(17.10.00.10) and Model A(17.00.10.10)

Output Terminals	Load Controlled	Switching Device and Schematic Ref	Electrical Ratings	Declaration
9-8	Compressor	K1	120 V, 0.5 HP	1.B
9-11	Heater	K2	120 V, 5 LRA, 12 LRA	1.B
9-7	Fan or Light	K3 or K4	120 V, 5 LRA, 12 LRA	1.B

OUTPUTS(+): Models A(30.10.00.00), A(30.00.10.00) and Model A(30.00.00.10)

Output Terminals	Load Controlled	Switching Device and Schematic Ref	Electrical Ratings	Declaration
9-8	Compressor	K1	120 V, 1.0 HP	1.B
10-12	Heater, Fan or Light	K2, K3, or K4	120 V, 5 LRA, 12 LRA	1.B

(+) Glossary:

Operating - Not intended to provide any safety or protective functionality. A control which starts or regulates the equipment during normal operation.

Protective - Intended to provide safety or protective functionality. A control the operation of which is intended to prevent a hazardous situation during abnormal operation of the equipment

Type 1 Action - Calibration Verification Testing or Functionality Verification testing not conducted.

A Type ".B" control has been investigated for "micro disconnection" applications. Disconnection of any pole (ungrounded conductor is not specified) for functional security purposes. Clearance distance across the open contacts for this type of disconnect is NOT specified. However, creepage/clearance distances apply to parts separated by the action and electric strength testing is required across the disconnection.

Designation System

ECS180NEO	30	10	05	05
I	II	III	IV	V

I. Series Name

II. Compressor Current rating

III. Defrost Current Rating

IV. Fan Load Rating

V. Light Load Rating

Condition of Acceptability - When installed in the final use equipment, etc., the following are among the considerations to be made:

1. The device shall be installed in compliance with the enclosure, mounting, spacing, and segregation requirements of the ultimate application.

2. The terminals are not acceptable for field connection. The acceptability of connections to these terminals, including temperature and secureness, shall be determined in the ultimate application.

3. These devices are intended to be factory installed. The controller has not been investigated for completing the ultimate electrical enclosure of the end-use equipment.

4. No portion of the control module assembly was evaluated as providing an ultimate electrical enclosure. Therefore, if any part of the control is deemed as an ultimate enclosure during the appliance investigation, enclosure testing shall be conducted as part of the appliance investigation.

5. The units are provided with a gasket. This gasket has not been evaluated as part of the unit per customer request.

20	TABLE: Creepage distance and clearance measurements		Verdict
	requirements creepage distance and clearance met		P
	supply working voltage (V).....:	120 VAC	—
	overvoltage category.....:	II	—
	rated impulse voltage according to table 20.1(V).....:	1500	—
	requirements for case B (20.1.7, 20.1.12) met (cl20.1 Note 2).....:		N/A

Spacings

This component has been judged on the basis of the required clearances and creepages in the UL60730-1 standard, Table 22 (Case A), 23 and 24. Spacings are based on the parameters indicated below and as described above under Technical Considerations

creepage distance Cd and clearance Cl across (type of insulation)	Nominal Volt. (V)	Pollution degree	required Cd (mm)	Cd (mm)	required Cl (mm)	Cl (mm)
RI: Primary traces to secondary traces	120	2	3.0	5.0	1.5	16
SI:	-	-	-	-	-	-
OI: Line to Neutral	120	2	1.5	2.0	0.5	1.2
OI: PCB between relay contact in open state	120	2	1.5	2.0	0.5	1.2

Abbreviations for types of insulation:
OP: operational
BI: basic
SI: supplementary
RI: reinforced

List of critical components					
Object/part or Description	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity
Enclosure (Main Body)	Chi Mei Corp	PA-765	Overall measurements 55.0 by 70.2 by 28.4 mm and 1.7 mm thick (Material Rated 80°C, V0)	QMFZ2	UL
Enclosure (Front Cover)	Idenmitsu	IR2500 (f2)	Overall measurements 34.0 by 78.0 by 17.0 mm and 1.1mm thick (Material Rated 125°C, V2)	QMFZ2	UL
Main Printed Wiring Board	Various	Various	Overall measures 66.0 by 63.5 mm and 1.0 mm thick. Ref. ILL 2. Rated as follows 1) suitable for the solder time and temperature used by the manufacturer 2) minimum PTI 175 V (CTI of 3) 3) minimum temperature: 105°C 4) minimum flame rating: 94V-2 5) composed of FR-4.0 laminate	ZPMV2/8	UL
Display Printed Wiring Board	Various	Various	Overall measures 67.4 by 24.0 mm and 1.0 mm thick. Ref. ILL 2. Rated as follows 1) suitable for the solder time and temperature used by the manufacturer 2) minimum PTI 175 V (CTI of 3) 3) minimum temperature: 105°C 4) minimum flame rating: 94V-2	ZPMV2/8	UL
Conformal Coating	Various	Various	Rated as follows 1) suitable for FR-4.0 laminate 2) minimum PTI 175 V (CTI of 3) 3) minimum temperature: 105°C 4) minimum flame rating: 94V-2 5) minimum spacing 0.76 mm 6) Applied in accordance with min and max thickness of UL certification.	QMJU2	UL

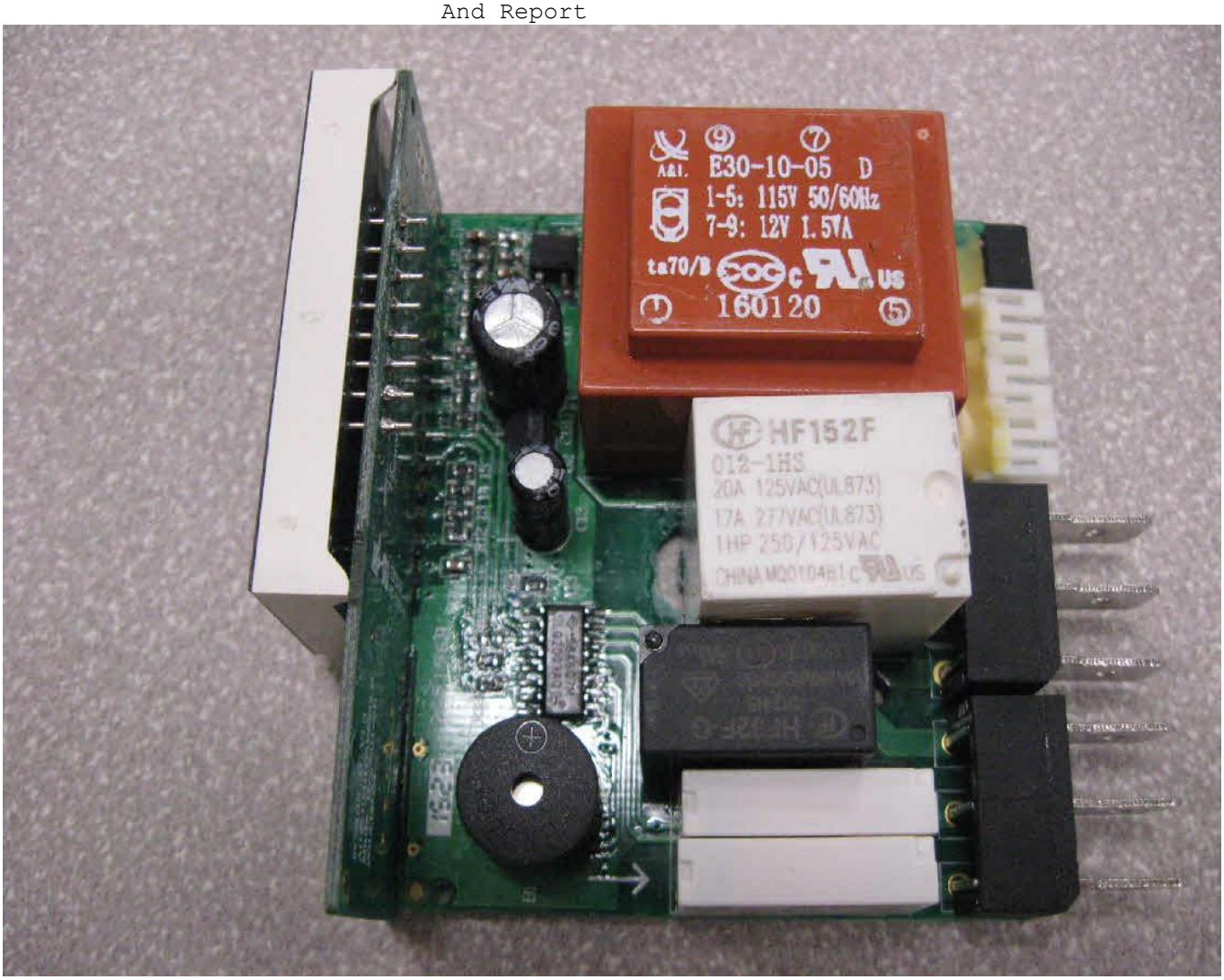
Relay (K1) for Models identified as 30	Xiamen HongFa Electrical	JQX-105F-1-12D-1HS	Rated 250 V, 30 A Resistive. 277 V, 40 A, @ 40 C, 250 V, 2 HP. (Tested as part of product for ratings and ambient, Class B insulation system.)	NLDX2/8	UL, CUL
Relay (K1) for Models identified as 17	Xiamen HongFa Electrical	HF152FD	Rated 125 V, 20 A (Resistive) @ 40 C; 125 V, ½ HP @ 40 C. . (Tested as part of product for ratings and ambient.)	NLDX2/8	UL, CUL
Relay (K2, K3 or K4) for Models with 10	Xiamen HongFa Electrical	HF32F-G-012-HS	Rated 250/277 V, 10 A (Resistive), 85 C. . (Tested as part of product for ratings and ambient.)	NLDX2/8	UL, CUL
Relay (K3, K4) for Models with 05	Xiamen HongFa Electrical	HF49D-012-1H12	Rated 250 V, 5 A General (Tested as part of product for ratings and ambient.)	NRNT2/8	UL, CUL
Terminal Block (J1- J5) for Model ECS2180 Series only	Ningbo Golten Electronics	GT128-5.0	Rated 300 V, 15 A (Industrial, with limited ratings), 12-24 AWG	XCFR2	UL
Terminal Block (J1) for Model ECS2180 Series only rated 30 A	Ningbo Golten Electronics	GT128-5.0	Rated 300 V, 20 A (Industrial, with limited ratings), 12-26 AWG; 3.5 in-lbs torque.	XCFR2	UL
Quick Connector Base for Model ECS180NEO	Chi Mei Corp	PA-765	Overall measurements 34.0 by 78.0 by 17.0 mm and 1.3 mm thick (Material Rated 80°C, V0)	QMFZ2	UL
Transformer	Zhenjian Honglian Electrician	E30-10-05	Input rated 115 V, 50/60 Hz, output rated 12 V, 1.5 VA, Class 2	XOKV2	UL
Bridge Rectifier (U1)	Fairchild Semiconductor	MB6S	rated 600V,0.5A; Tj = 150°C	QQQX2	UL
Capacitor (C12)	Various	Various	Electrolytic, rated 470 uF, minimum 105°C	-	-


Elitech
Software
Version:V1.1
Display Board:V1.3
Power Board:V1.0
Danger! Electric shock Risk!
Connect the terminal with the power cut-off

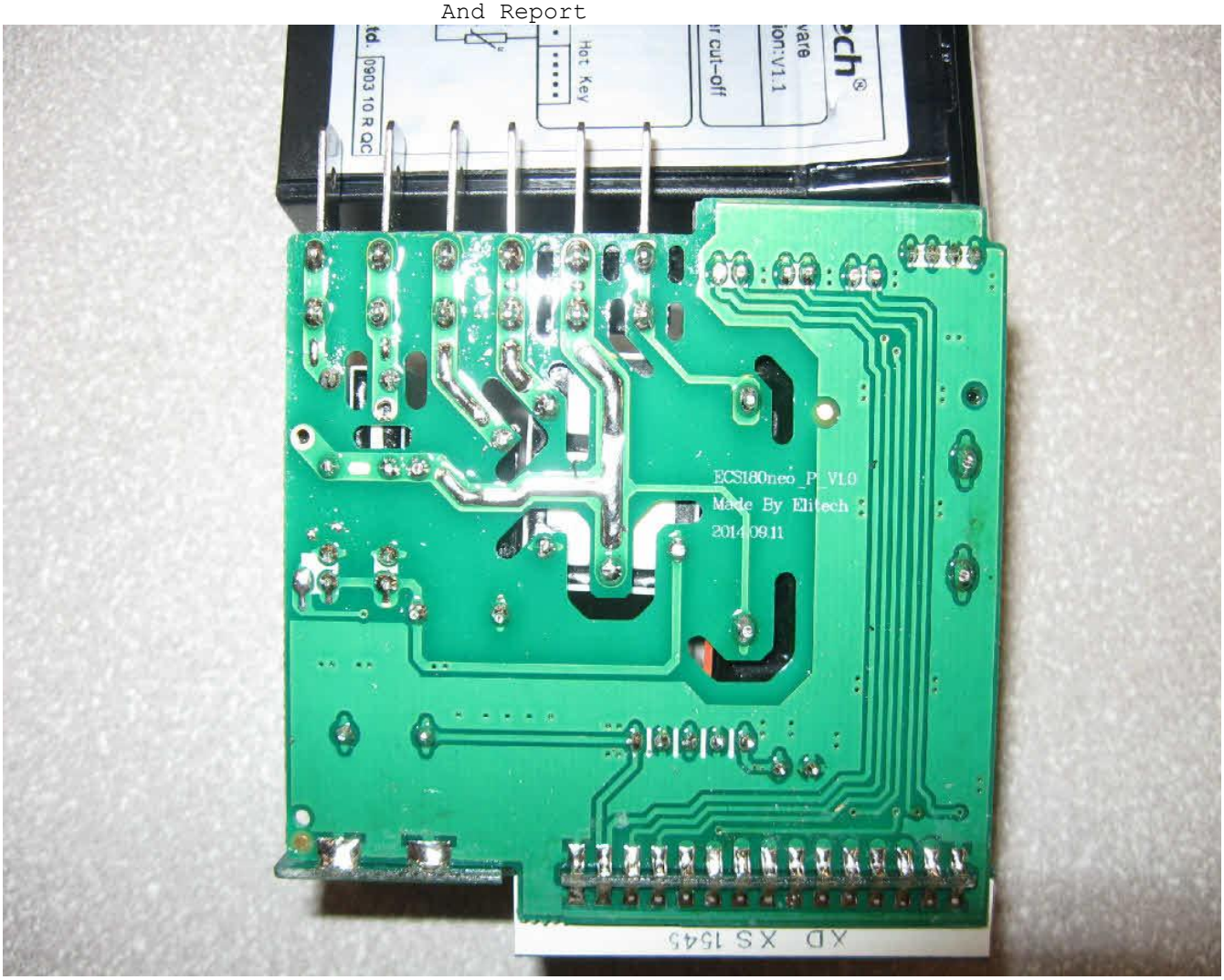
C171946576


Elitech
Display Board: V1.3
Power Board: V1.0
Software Version:V1.1
Danger! Electric shock Risk!
Connect the terminal with the power cut-off
5A 5A 10A 17(5)A
1 2 3 4 5 6
N N N N L N
110VAC 50/60Hz
Hot Key
Door switch
Jiangsu Jingchuang Electronics Co.,Ltd.
0903 10 R QC

C171946577


E30-10-05 D
1-5: 115V 50/60Hz
7-9: 12V 1.5VA
160120
HF152F
012-1HS
20A 125VAC(UL873)
17A 277VAC(UL873)
1HP 250/125VAC

C171946578



C171946579

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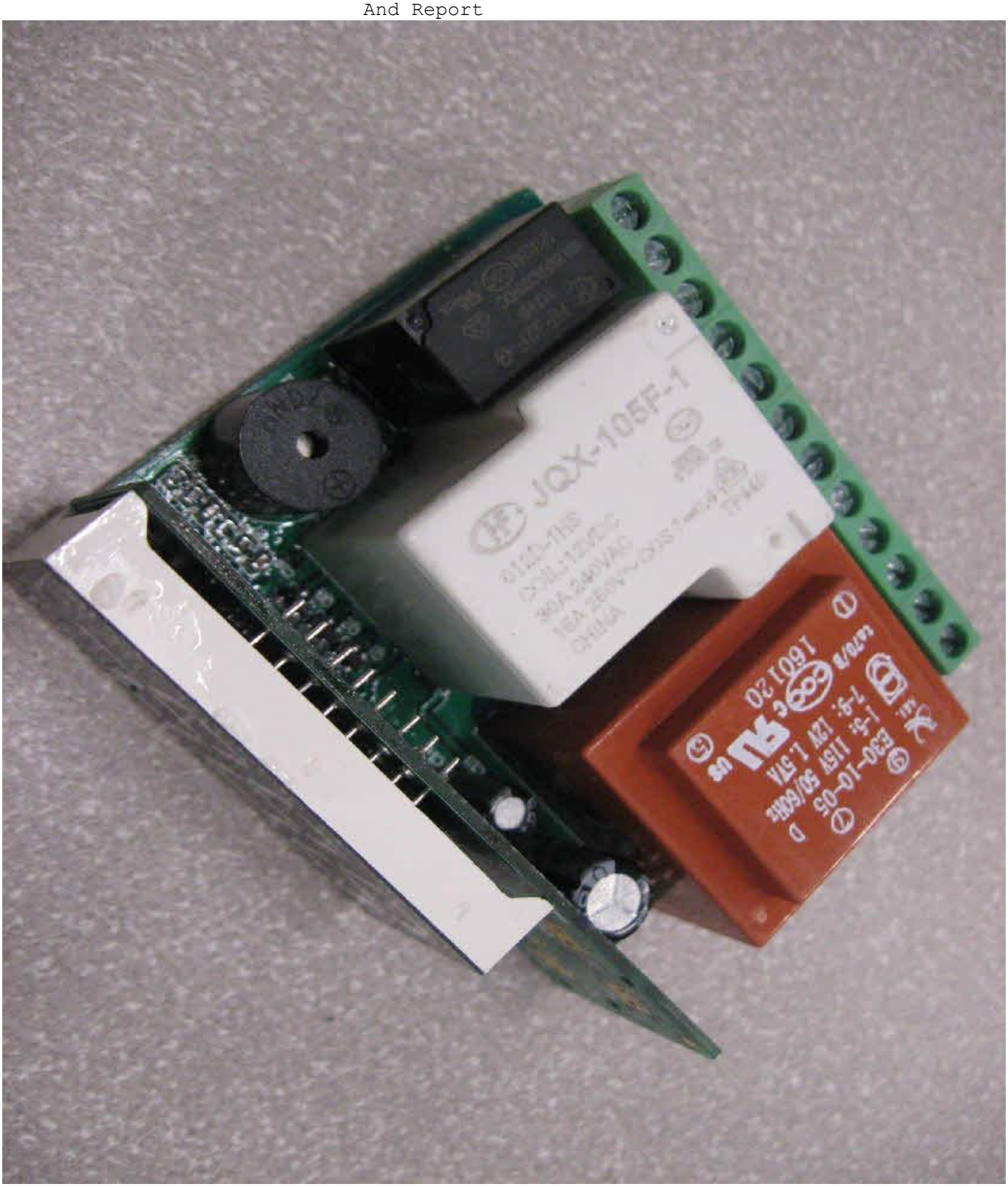


C171946581

Elitech®

ECS-180neo Temperature Controller User Manual

1.Product General

1.1 Product configuration

Ser iallocode:	Relay				Sensor				Buzzer (optional)
	Refrigeration HP	Defrost A (optional)	Fan A (optional)	Light /external alarm A (optional)	Cabinet temp	Defrost (optional)	Door switch (optional)		
A17.10.10.00/S24.B	1/2	10	10	x	YES	YES	YES	YES	
A17.10.30.10/S24.B	1/2	10	x	10	YES	YES	YES	YES	
A17.20.10.10/S24.B	1/2	x	10	10	YES	YES	YES	YES	
A17.10.05.05/S24.B	1/2	10	5	5	YES	YES	YES	YES	
A20.10.00.00/S24.B	1	10	x	x	YES	YES	YES	YES	
A30.00.10.00/S24.B	1	x	10	x	YES	YES	YES	YES	
A30.00.00.10/S24.B	1	x	x	10	YES	YES	YES	YES	

Note: The number represents the size of drivable and resistive loads.
A (17.10.10.00)S24.B, A (17.10.00.10)S24.B,A (17.00.10.10)S24.B,A (17.10.05.05)S24.B, which could directly drive single-phase 1.5Hp compressor(220VAC) or 1.0Hp compressor(110VAC) .
A (30.10.00.00)S24.B, A (30.00.10.00)S24.B,A (30.00.00.10)S24.B, which could directly drive single-phase 1.0Hp compressor(220VAC) or 1/2Hp compressor(110VAC) .

1.2 Product application description

- ECS-180 neo temperature controller could be used in the middle and low temperature medicine cabinet, kitchen cabinet, supermarket split cabinet, air curtain cabinet, island counter, wine cabinet, etc.
- The controller adopts building block design concept and users could select defrost, fan, light/ external alarm according to their demand.
- The function of evaporator sensor, condenser sensor, door switch and buzzer is optional.
- Large panel of color digital tube, work status symbol display, temperature display resolution is 0.1, the front panel waterproof level IP65.
- It has temperature sensor self-test function, and once test the failures, it has multiple protection and alarm methods.
- Copy card function, convenient for the manufacturing and after-sale service of equipment manufacturers.
- Temperature measuring unit could switch between Celsius and Fahrenheit.
- With the function of Synchronous defrost switch signal detection, and it could form the network of real-time clock Synchronous defrost.
- Cabinet temperature over limit alarm has two modes: absolute value and relative value.
- Light/external alarm relay could be selected by the software, and when select the function of external alarm relay, it could connect the remote alarm bell.
- With the complete control logic of hot-gas defrost start without the pressure difference in the refrigerant pipe, to prevent starting with the pressure, for the purpose of a longer compressor life.

2. Operation and display panel

3. Specification

1) Mounting size:(71mm)×(29mm) (max)
2) Product size :(78.5mm) × (34.5mm) × (82mm)

4. Technical parameters

1) Measuring range: **-50℃~90℃ or -58℉~194℉** （only when sensor calibration is set as 0）
2) Resolution: **0.1℃ or 1℉**
3) Accuracy: **-40℃~50℃,±1℃,51℃~70℃,±2℃,others, ±3℃**
or -40℉~122℉,±2℉,123℉~158℉,±4℉,others, ±6℉
4) Controlling range: **-50℃~85℃ or -58℉~185℉**
5) Power supply: 220±10 %(VAC) 50/60Hz
6) Power consumption: <3W
7) Input: Cabinet sensor, evaporator sensor, door switch
(When door is open, sensor signal: normal open)
8) Front panel waterproof level: IP65
9) Work ambient temperature: **0℃~55℃**
10) Storage temperature: **-25℃~75℃**
11) Relative humidity: **20%~85%** （non condensing）

5. Indicator light status description

Indicator light	Symbol	Status	Meaning
Setting	**Set**	ON	Parameter setting
		OFF	Status of temperature measuring and controlling
Refrigeration	❄	ON	Refrigeration work
		OFF	Refrigeration stop
		FLASH	Refrigeration time delay
Defrost	❄	ON	Defrost work
		OFF	Defrost stop
Fan	❀	ON	Fan work
		OFF	Fan stop
Defrost dripping	**drip**	ON	Start defrost dripping
		OFF	Stop defrost dripping
Door switch	🚪	ON	Cabinet door open
		OFF	Cabinet door close

6. Parameter list

Menu	Functions	Setting range	Default	Unit
Common user menu				
St	Temperature set value	Upper limit~Lower limit	4℃	℃/℉
Po	Administrator menu Password	00~99（password is 55,unmodified）	00	/
Administrator's menu				
C1	Hysteresis value	0.5℃~ 9.0 ℃ 1℉~ 20℉	4.0℃	℃ /℉
C2	Compressor start Min. interval	0~60	5	min
C3	Compressor initial start Min. interval	0~90	5	min
C4	Cabinet sensor calibration	-10.0℃ ~ 10.0℃ -20℉~ 20℉	0.0℃	℃/℉
C5	Temperature set lower limit	-50℃~temperature set value -58℉~ temperature set value	-2℃	℃/℉
C6	Temperature set upper limit	temperature set value~85 ℃ temperature set value~185 ℉	22℃	℃/℉
C7	Max standby time after finishing compressor start Min. interval (note①)	0~90 0:Max stancby time calculation is forbiden	9	min
C8	Refrigeration Min. running time	0~90 0. Refrigeration Min.running time calculation is forbiden	0	min
d1	Evaporator sensor selection	0: Disabled 1: Enabled	1	/
d2	Evaporator sensor calibration	-10.0℃ ~ 10.0℃ -20℉~ 20℉	0.0℃	℃/℉
d3	Defrost cycle calculation	0: accumulated refrigeration time 1: natural time	1	/
d4	Defrost cycle	0~90 0: Defrost forbidden	2	hour
d5	Defrost status display	0:Display cabinet temperature 1:Display dEF during defrost and defrost time delay, display cabinet temperature after finishing defrost time delay. 2:Always display dEF during defrost and defrost dripping 3:Always display start-defrost cabinet temperature during defrost and defrost dripping	2	/
d6	The maximum time of defrost	1~90	25	min
d7	Defrost termination temperature	0℃~50℃ 32℉~ 122℉	12℃	℃/℉
d8	Dripping time after defrost	0~60 0: Defrost cripping time forbidden	2	min
d9	Cabinet temperature display time delay after defrost	0~90	10	min
d10	Time delay after defrost start	0~60 0:Defrost start time delay is canceled	10	min
d11	Defrost type	0:Electric heating defrost 1:Hot gas defrost	0	/
F1	Fan running mode	0:Fan and compressor run or stop synchronically 1:Fan runs continuously, stops during defrost 2. Fan runs continuously, stops during defrost and defrost dripping 3: Fan runs continuously, stops during defrost, fan time delay after defrost 4:Controlled by defrost sensor, fan stops during defrost.	3	/
F2	Fan initial start time delay after electrified	0~60	4	min
F3	Fan start time delay after defrost	0~60 0: Fan time delay canceled	2	min
F4	Fan working lowest temp.	-50℃ ~Fan working highest temp. -58℉ ~Fan working highest temp.	-12	• ℉
F5	Fan working highest temp.	Fan working lowest temp.~85℃ Fan working lowest temp.~185℉	-5	• ℉
A1	Compressor run and stop in a proportional time after cabinet sensor failure	0: Cancel the mode of "Run/stop in a proportional time" 1: Start the mode of "Run/stop in a proportional time"	1	/
A2	Compressor stop time in the mode of "Run/stop in a proportional time"	1~60	5	min
A3	Compressor running time in the mode of "Run/stop in a proportional time"	1~60	30	min
A4	Buzzer alarm output switch	0: Buzzer output disabled 1: Buzzer output enabled	1	/
A5	Cabinet temperature lower limit alarm value	-50℃ ~Cabinet temperature upper limit alarm value -58℉ ~Cabinet temperature upper limit alarm value	-10℃	℃/℉
A6	Cabinet temperature upper limit alarm value	Cabinet temperature lower limit alarm value~85℃ Cabinet temperature lower limit alarm value~185℉	24℃	℃/℉
A7	Cabinet over temperature alarm time delay	0~60	20	3min
A8	The initial cabinet over temperature alarm time delay after electrified	0~60	40	3min
A9	Over temperature alarm upper deviation	1℃~30℃ 1℉~60℉	10℃	℃/℉
A10	Over temperature alarm lower deviation	1℃~30℃ 1℉~60℉	5℃	℃/℉
A11	Over temperature alarm mode	0: Absolute temperature point 1:set value+ over temperature alarm deviation	0	/
A12	Light/Alarm relay selection	0:Light output 1:Alarm output	0	/

do1	Control output of door swtch	0:Door switch is canceled 1:Close fan during door open 2: Turn on the light when door open, turn off the light when door closed 3:Close fan and turn on the light when door open, Turn off the light when door closed 4: When door is open, it is the synchronous signal input of defrost, defrost will start.	0	/
do2	Buzzer response when door open	0:NO 1:YES	0	/
cd1	Condenser sensor selection	0:Disabled 1:Enabled	0	/
cd2	Condenser high temperature alarm start value	30℃~90℃ 86℉~194℉	55℃	℃/℉
cd3	Lower hysteresis of condenser high temperature alarm	1℃~15℃ 2℉~30℉	5℃	℃/℉
u1	Celsius /Fahrenheit selection (note②)	00：Fahrenheit 01：Celsius	01	/

Note①: Only valid when the cabinet sensor is in proper working.
Note②: After switch between Celsius /Fahrenheit, users need to adjust all related parameters themselves to make sure the correct parameter setting.

7. Keys Function

7.1 Keys description

Keys	Function	Button action
Set	Enter the status of parameter setting	pressing the keys for 3s
	Switch between menu and parameter	Press the response
☼	Adjust menu and parameters	Press the response
	Open/close light(only valid for the model with light control)	Press the response
	Upload the data to copy card	pressing the keys for 3s
↻	Adjust menu and parameters	Press the response
	Download the copy card	pressing the keys for 3s
Ref	View evaporator sensor temperature	Press the response
	Exit from parameter setting	Press the response
	Press 3s to forced switch between refrigeration, defrost/defrost delay, defrost dripping	pressing the keys for 3s

7.2 Keys operation

1) In the status of temperature measuring and controlling, press **Set** key for three seconds to enter user menu, it displays the code St, then press **Set** key again, display the value of St. It could be modified by pressing the key ☼ or ↻.
When it displays the code St, press the key ☼, display the code Po, then press **Set** key, display 00, at this time, press ☼ or ↻ to input the password of administrator menu.
Press **Set** key again to confirm the password input, and the controller will automatically verify the correctness of password. When it passes, it could select parameter items St、Po、C1、C2……U1 (that is, any parameter items both in the administrator menu and user manuals) by pressing the key ☼ or ↻ Or else, only the parameters items St and Po available, others could not be displayed.
When the parameter item is selected, press **Set** key to enter to the setting of the current item, press ☼ or ↻to modify the value, and then press **Set** key to return to the menu.
Under the status of parameter setting, press ❄ key or no key operation within 30s, it will exit from parameter setting and automatically save the current parameter value.
Note: The password input of administrator menu only is valid for single entering. After exit from the parameter setting by pressing ❄, it needs to input the correct password again for next parameter adjustment.

2) Temperature viewing
In the status of temperature measuring and controlling, press ❄ to view the current evaporator sensor measured temperature value (note: evaporator sensor is enables and works properly).

3) Manually forced operation
In the status of temperature measuring and controlling, press ❄ for three seconds to force the switch between refrigeration, defrost/defrost delay, defrost dripping. Press ☼ to open or close the light (Only valid when Light/alarm relay is used as light and there is no linkage between light control and door switch.)

8. Copy card

8.1 Upload (Copy the parameters of controllers to copy card)
1) Set controller parameters by keys;
2) Insert copy card, hold and press ☼ key until it displays"uP" in the front panel.
3) Plug off copy card in 3 seconds, then power on controller again.

8.2 Download (Copy the parameter of copy card to the controller)
1) Insert copy card, hold and press ↻ key until it display "do" in the front panel.
2) Plug off the copy card, and power on the controller again in 3 seconds.
Note: If it displays"Er", it indicates the failure of programming. At this time, you need to check whether the copy card is reliably inserted, if yes, repeat the above steps again.
If it displays"EP", it indicates inconsistent data between copy card and controller, programming fails. At this time, need to change to the right copy card and repeat the steps above; or upload the data of copy card again, and repeat the steps above.
(★ For copying process, it requires a reliable power supply and effective connection of copy card, and it is forbidden to plug off the copy card before finishing operation)

9. Control output

9.1 Compressor:
Normal status: When the cabinet temperature is higher than the set temperature (St) +hysteresis (C1), and finish the compressor start Min. interval, the compressors will start;
When the cabinet temperature is lower than the set temperature (St), and the continuous refrigeration running time is large than C8, the compressor will close.
When the cabinet temperature is between the set temperature(St) and the temperature of the set temperature(St) +hysteresis(C1), if the refrigeration is closed, then after finishing compressor start Min. interval and Max.standby time after finishing compressor start Min. interval(C7), the refrigeration will start.
Note: Compressor start Min.interval is calculated by Compressor initial start Min. interval (C3) after it is electrified for the first time, and it will be calculated by Compressor start Min. interval (C2) in the future.
Cabinet temperature sensor failure:
A1=0, cancel the function of "Run/stop in a proportional time", the compressor closes;
A1=1, open the function of "Run/stop in a proportional time", the compressor will run in cycle according to the proportion (Refrigeration running time A3 and refrigeration stop time A2).

9.2 Defrost
1) d4 = 0, Defrost is forbidden.
2) d4 ≠ 0, when it is not in the state of defrost nor defrost dripping:
① Evaporator sensor is enabled (d1 = 1), and evaporator sensor temperature is higher than Defrost termination temperature (d7), then defrost could not be started.
② Evaporator sensor is enabled (d1 = 1) and evaporator sensor temperature is lower than Defrost termination temperature (d7) or evaporator sensor is disabled (d1 = 0) (Any of the following conditions could start defrost):
a、When defrost cycle (d4) finishes running, defrost is started;
Note: Defrost cycle is calculated according to the selected natural time (d3 = 1) or accumulated refrigeration time (d3 = 0);
b、Hold and press ❄ for three seconds, start defrost;
c、If the door switch is as synchronous signal input of defrost (d01 = 4) ,the door open is the external synchronous defrost signal, the defrost is started.
Note: When finish time delay after defrost start (d10), there will be an output of defrost.
3) In the state of defrost (Any of the following condition could close defrost):
① Evaporator sensor is enabled (d1 = 1), and evaporator sensor temperature is higher than defrost termination temperature (d7), defrost is closed;
② When finish running the maximum time of defrost (d6), defrost is closed;
③ Hold and press ❄for three seconds, defrost is closed;
4) After defrost, it enters the state of defrost dripping, and within dripping time after defrost(d8), refrigeration output is forbidden. The dripping will be discharged during this time period.After finishing dripping time after defrost, it enters to the status of refrigeration cycle.
Note: Defrost status display
d5=0: Display cabinet temperature
d5=1:Display dEF during defrost and defrost time delay, display cabinet temperature after finishing defrost time delay.
d5=2:Always display dEF during defrost and defrost dripping
d5=3:Always display start-defrost cabinet temperature during defrost and defrost dripping
Defrost type:
d11=0:Electric heating defrost
d11=1:Hot gas defrost

9.3 Fan:
Fan running mode:
F1 = 0: Fan and compressor run or stop synchronically;
F1 = 1: Fan runs continuously, stops during defrost;
F1 = 2: Fan runs continuously, stops during defrost and defrost dripping;
F1 = 3: Fan runs continuously, stops during defrost, fan starts when finish time delay after defrost(F3);
F1 = 4: Controlled by defrost sensor temperature, and it stops during defrosting(defrost sensor temperature >Fan working highest temperature(F5)、defrost sensor temperature < Fan working lowest temperature (F4)、defrost sensor failure、defrost sensor is forbidden (d1=0)、controller in the status of defrosting).
When the door switch parameter is selected as 1 or 3, when the cabinet door is open, fan will be close. And when the door is closed, fan will recover to the working state before door open.
Note: Fan will not be permitted to run until finish Fan initial start time delay after electrified (F2).

9.4 Light
do1=0 or 1 or 4: press ☼ to open the light, and press ☼ again to close the light.
do1=2 or 3: When door open, the light will be opened, and when close the door, light will be closed.
Note: A12 = 0, Light/Alarm relay will be used as light relay, and light relay will pick-up when the light opens, disconnect when the light closes.

9.5 Internal Alarm
Temperature sensor failure alarm:
When cabinet sensor fails, the digital tube display E1;
When evaporator sensor fails, the digital tube display E2;
When condenser sensor fails, the digital tube display E3;
Condenser high temperature alarm: If the condenser sensor is selected, when the condenser temperature is higher than the condenser high temperature alarm start value, it will alarm and display cH. While it will not have an effect on the control output. When the temperature falls back to (the condenser high temperature alarm value-con denser high temperature alarm lower hysteresis), the alarm is released.
Cabinet over temperature alarm: When the cabinet temperature is higher than the cabinet temperature upper limit alarm value(A11=0) or higher than (set value + over temperature alarm upper deviation: A11=1), and cabinet over temperature alarm time delay or the initial cabinet over temperature alarm time delay after electrified has been finished, the digital tube will display rH, and the alarm will not be released until the temperature is lower than the cabinet temperature upper limit alarm value(A11=0) or lower than (set value+ over temperature alarm upper deviation: A11=1); When the cabinet temperature is lower than the cabinet temperature lower limit alarm value (A11=0) or lower than (set value- over temperature alarm lower deviation: A11=1), and cabinet over temperature alarm time delay or the initial cabinet over temperature alarm time delay after electrified has been finished, the digital tube will display rL, and the alarm will not be released until the temperature is higher than the cabinet temperature lower limit alarm value or (set value- over temperature alarm lower deviation: A11=1).
If the buzzer is selected as 1(A4=1), when there is alarm, door open(do2 is set as 1), the buzzer beeps;
When all alarm is released and door is closed(do2 is set as 1), the buzzer mutes, or press any key to mute the alarm.

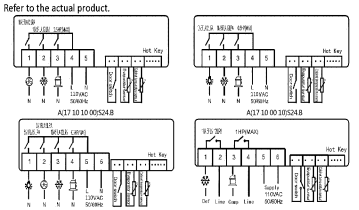
Alarm code	Alarm reason
E1	Cabinet temperature sensor failure
E2	Evaporator sensor failure
E3	Condenser sensor failure
cH	Condenser high temperature alarm
rH	Cabinet high temperature alarm
rL	Cabinet low temperature alarm
Er	Copy card programming failure
EP	Inconsistent data between copy card and controller, programming failure

9.6 External alarm output (A12=1)
The external alarm relay will pick up when there is alarm or door is open (do2 is set as 1), and it will disconnect when all alarm is released and the door is closed (do2 is set as 1).

9.7 The table of controller output status

System status \ Defrost type	Electric heating defrost	Hot gas defrost
Refrigeration output	Compressor start	Compressor start
	Electric heating close	Four-valves close
Defrost time delay	Compressor stop	Compressor stop
	Electric heating close	Four-valves open
Defrost output	Compressor stop	Compressor start
	Electric heating open	Four-valves open
Defrost dripping	Compressor stop	Compressor stop
	Electric heating close	Four-valves open

10. Wiring diagram
Refer to the actual product.



11. Safety rules: A/17 10 05 05/524.8

★Danger:
1. Strictly distinguish the power wire, relay output, sensor down-lead and data line, and the relay could not be overloaded.
2. Prohibit connecting the wire terminals without electricity cut-off.

★Warning:
Prohibit using this unit under the environment of over damp, high temp., strong electromagnetism interference or strong corrosion.

★Notice:
1. The power supply should conform to the voltage value indicated in the instruction, and make sure a steady power supply.
2. To avoid the possible interference, the sensor down-lead/data line and power wire should be kept in a proper distance.
3. When evaporator sensor is installed, the sensor should be well connected with the copper tube which is 5cm away from evaporator inlet.

V 1.0

Elitech®

ECS-2180neo Temperature Controller User Manual

1.Product General

1.1 Product configuration

Serial code:	Relay				Sensor			Buzzer (optional)
	Refrigeration Hp	Defrost A (optional)	Fan A (optional)	Light /external alarm A (optional)	Cabinet temp	Defrost (optional)	Door switch (optional)	
A(17.10.10.00)S24.B	0.5	10	10	×	YES	YES	YES	YES
A(17.10.00.10)S24.B	0.5	10	×	10	YES	YES	YES	YES
A(17.00.10.10)S24.B	0.5	×	10	10	YES	YES	YES	YES
A(30.10.00.00)S24.B	1	10	×	×	YES	YES	YES	YES
A(30.00.10.00)S24.B	1	×	10	×	YES	YES	YES	YES
A(30.00.00.10)S24.B	1	×	×	10	YES	YES	YES	YES

Note: The number represents the size of drivable and resistive loads.

A (17.10.10.00)S24.B, A (17.10.00.10)S24.B,A (17.00.10.10)S24.B , which could directly drive single-phase 1.5Hp compressor(220VAC) or 1.0Hp compressor(110VAC) .
A (30.10.00.00)S24.B, A (30.00.10.00)S24.B,A (30.00.00.10)S24.B , which could directly drive single-phase 1.0Hp compressor(220VAC) or 1/2Hp compressor(110VAC) .

1.2 Product application description

- ECS-2180 neo temperature controller could be used in the middle and low temperature medicine cabinet, kitchen cabinet, supermarket split cabinet, air curtain cabinet, island counter, wine cabinet, etc.
- The controller adopts building block design concept and users could select defrost, fan, light/ external alarm according to their demand.
- The function of evaporator sensor, condenser sensor, door switch and buzzer is optional.
- Large panel of color digital tube, work status symbol display, temperature display resolution is 0.1, the front panel waterproof level IP65.
- It has temperature sensor self-test function, and once test the failures, it has multiple protection and alarm methods.
- Copy card function, convenient for the manufacturing and after-sale service of equipment manufacturers.
- Temperature measuring unit could switch between Celsius and Fahrenheit.
- With the function of Synchronous defrost switch signal detection, and it could form the network of real-time clock Synchronous defrost.
- Cabinet temperature over limit alarm has two modes: absolute value and relative value.
- Light/external alarm relay could be selected by the software, and when select the function of external alarm relay, it could connect the remote alarm bell.
- With the complete control logic of hot-gas defrost start without the pressure difference in the refrigerant pipe, to prevent starting with the pressure, for the purpose of a longer compressor life.

2. Operation and display panel

3. Specification

1) Mounting size:(71mm)×(29mm) (max)
2) Product size :(78.5mm) × (34.5mm) × (74mm)

4. Technical parameters

1) Measuring range: -50℃～90℃ or -58℉～194℉ (only when sensor calibration is set as 0)
2) Resolution: 0.1℃ or 1℉
3) Accuracy: -40℃～50℃,±1℃,51℃～70℃,±2℃,others, ±3℃
or -40℉～122℉,±2℉,123℉～158℉,±4℉,others,±6℉
4) Controlling range: -50℃～85℃ or -58℉～185℉
5) Power supply: 220±10 %(VAC) 50/60Hz
6) Power consumption: <3W
7) Input: Cabinet sensor, evaporator sensor, door switch
(When door is open, sensor signal: normal open)
8) Front panel waterproof level: IP65
9) Work ambient temperature: 0℃～55℃
10) Storage temperature: -25℃～75℃
11) Relative humidity: 20%～85% (non condensing)

5. Indicator light status description

Indicator light	Symbol	Status	Meaning
Setting	Set	ON	Parameter setting
		OFF	Status of temperature measuring and controlling
Refrigeration	❄	ON	Refrigeration work
		OFF	Refrigeration stop
		FLASH	Refrigeration time delay
Defrost	❄	ON	Defrost work
		OFF	Defrost stop
Fan		ON	Fan work
		OFF	Fan stop
Defrost dripping	drip	ON	Start defrost dripping
		OFF	Stop defrost dripping
Door switch		ON	Cabinet door open
		OFF	Cabinet door close

6. Parameter list

Menu	Functions	Setting range	Default	Unit
Common user menu				
St	Temperature set value	Upper limit~Lower limit	4℃	℃/℉
Po	Administrator menu Password	00～99（password is 55,unmodified）	00	/
Administrator's menu				
C1	Hysteresis value	0.5℃～9.0℃ 1℉～20℉	4.0℃	℃/℉
C2	Compressor start Min. interval	0~60	5	min
C3	Compressor initial start Min. interval	0~90	5	min
C4	Cabinet sensor calibration	-10.0℃～10.0℃ -20℉～20℉	0.0℃	℃/℉
C5	Temperature set lower limit	-50℃~temperature set value -58℉~ temperature set value	-2℃	℃/℉
C6	Temperature set upper limit	temperature set value~85 ℃ temperature set value~185 ℉	22℃	℃/℉
C7	Max.standby time after finishing compressor start Min. interval (note①)	0~90 0:Max.standby time calculation is forbidden	9	min
C8	Refrigeration Min. running time	0~90 0: Refrigeration Min.running time calculation is forbidden	0	min
d1	Evaporator sensor selection	0: Disabled 1: Enabled	1	/
d2	Evaporator sensor calibration	-10.0℃～10.0℃ -20℉～20℉	0.0℃	℃/℉
d3	Defrost cycle calculation	0: accumulated refrigeration time 1: natural time	1	/
d4	Defrost cycle	0~90 0: Defrost forbidden	2	hour
d5	Defrost status display	0:Display cabinet temperature 1:Display dEF during defrost and defrost time delay, display cabinet temperature after finishing defrost time delay. 2:Always display dEF during defrost and defrost dripping 3:Always display start-defrost cabinet temperature during defrost and defrost dripping	2	/
d6	The maximum time of defrost	1~90	25	min
d7	Defrost termination temperature	0℃~50℃ 32℉~ 122℉	12℃	℃/℉
d8	Dripping time after defrost	0~60 0: Defrost dripping time forbidden	2	min
d9	Cabinet temperature display time delay after defrost	0~90	10	min
d10	Time delay after defrost start	0~60 0:Defrost start time delay is canceled	10	min
d11	Defrost type	0:Electric heating defrost 1:Hot gas defrost	0	/
F1	Fan running mode	0:Fan and compressor run or stop synchronically 1:Fan runs continuously, stops during defrost 2: Fan runs continuously, stops during defrost and defrost dripping 3: Fan runs continuously, stops during defrost, fan time delay after defrost 4:Controlled by defrost sensor, fan stops during defrost.	3	/
F2	Fan initial start time delay after electrified	0~60	4	min
F3	Fan start time delay after defrost	0~60 0: Fan time delay canceled	2	min
F4	Fan working lowest temp.	-50℃~Fan working highest temp. -58℉~Fan working highest temp.	-12	℃/℉
F5	Fan working highest temp.	Fan working lowest temp.~85℃ Fan working lowest temp.~185℉	-5	℃/℉
A1	Compressor run and stop in a proportional time after cabinet sensor failure	0: Cancel the mode of "Run/stop in a proportional time" 1: Start the mode of "Run/stop in a proportional time"	1	/
A2	Compressor stop time in the mode of "Run/stop in a proportional time"	1~60	5	min
A3	Compressor running time in the mode of "Run/stop in a proportional time"	1~60	30	min
A4	Buzzer alarm output switch	0: Buzzer output disabled 1: Buzzer output enabled	1	/
A5	Cabinet temperature lower limit alarm value	-50℃~Cabinet temperature upper limit alarm value -58℉~Cabinet temperature upper limit alarm value	-10℃	℃/℉
A6	Cabinet temperature upper limit alarm value	Cabinet temperature lower limit alarm value~85℃ Cabinet temperature lower limit alarm value~185℉	24℃	℃/℉
A7	Cabinet over temperature alarm time delay	0~60	20	3min
A8	The initial cabinet over temperature alarm time delay after electrified	0~60	40	3min
A9	Over temperature alarm upper deviation	1℃~30℃ 1℉~60℉	10℃	℃/℉
A10	Over temperature alarm lower deviation	1℃~30℃ 1℉~60℉	5℃	℃/℉
A11	Over temperature alarm mode	0: Absolute temperature point 1:set value+ over temperature alarm deviation	0	/
A12	Light/Alarm relay selection	0:Light output 1:Alarm output	0	/

do1	Control output of door switch	0:Door switch is canceled 1:Close fan during door open 2: Turn on the light when door open, turn off the light when door closed 3:Close fan and turn on the light when door open, Turn off the light when door closed 4: When door is open, it is the synchronous signal input of defrost, defrost will start.	0	/
do2	Buzzer response when door open	0:NO 1:YES	0	/
cd1	Condenser sensor selection	0:Disabled 1:Enabled	0	/
cd2	Condenser high temperature alarm start value	30℃～90℃	55℃	℃/℉
		86℉～194℉		
cd3	Lower hysteresis of condenser high temperature alarm	1℃～15℃	5℃	℃/℉
		2℉～30℉		
u1	Celsius /Fahrenheit selection (note②)	00: Fahrenheit 01: Celsius	01	/

Note①: Only valid when the cabinet sensor is in proper working.
Note②: After switch between Celsius /Fahrenheit, users need to adjust all related parameters themselves to make sure the correct parameter setting.

7. Keys Function

7.1 Keys description

Keys	Function	Button action
Set	Enter the status of parameter setting	pressing the keys for 3s
	Switch between menu and parameter	Press the response
	Adjust menu and parameters	Press the response
	Open/close light(only valid for the model with light control)	Press the response
	Upload the data to copy card	pressing the keys for 3s
	Adjust menu and parameters	Press the response
	Download the copy card	pressing the keys for 3s
Run	View evaporator sensor temperature	Press the response
	Exit from parameter setting	Press the response
	Press 3s to forced switch between refrigeration, defrost/defrost delay, defrost dripping	pressing the keys for 3s

7.2 Keys operation

1) In the status of temperature measuring and controlling, press Set key for three seconds to enter user menu, it displays the code St, then press Set key again, display the value of St. It could be modified by pressing the key or .
When it displays the code St, press the key, display the code Po, then press Set key, display 00, at this time, press or to input the password of administrator menu.
Press Set key again to confirm the password input, and the controller will automatically verify the correctness of password. When it passes, it could select parameter items St、Po、C1、C2.....U1 (that is, any parameter items both in the administrator menu and user manuals) by pressing the key or . Or else, only the parameters items St and Po available, others could not be displayed.
When the parameter item is selected, press Set key to enter to the setting of the current item, press or to modify the value, and then press Set key to return to the menu.
Under the status of parameter setting, press key or no key operation within 30s, it will exit from parameter setting and automatically save the current parameter value.
Note: The password input of administrator menu only is valid for single entering. After exit from the parameter setting by pressing , it needs to input the correct password again for next parameter adjustment.

2) Temperature viewing
In the status of temperature measuring and controlling, press to view the current evaporator sensor measured temperature value (note: evaporator sensor is enables and works properly).

3) Manually forced operation
In the status of temperature measuring and controlling, press for three seconds to force the switch between refrigeration, defrost/defrost delay, defrost dripping. Press to open or close the light (Only valid when Light/alarm relay is used as light and there is no linkage between light control and door switch.)

8. Copy card

8.1 Upload (Copy the parameters of controllers to copy card)
1) Set controller parameters by keys;
2) Insert copy card, hold and press key until it displays"uP" in the front panel.
3) Plug off copy card in 3 seconds, then power on controller again.

8.2 Download (Copy the parameter of copy card to the controller)
1) Insert copy card, hold and press key until it display "do" in the front panel.
2) Plug off the copy card, and power on the controller again in 3 seconds.
Note: If it displays"Er", it indicates the failure of programming. At this time, you need to check whether the copy card is reliably inserted, if yes, repeat the above steps again.
If it displays"EP", it indicates inconsistent data between copy card and controller, programming fails. At this time, need to change to the right copy card and repeat the steps above; or upload the data of copy card again, and repeat the steps above.
(★ For copying process, it requires a reliable power supply and effective connection of copy card, and it is forbidden to plug off the copy card before finishing operation)

9. Control output

9.1 Compressor:
Normal status: When the cabinet temperature is higher than the set temperature (St) +hysteresis (C1), and finish the compressor start Min. interval, the compressors will start;
When the cabinet temperature is lower than the set temperature (St), and the continuous refrigeration running time is large than C8, the compressor will close.
When the cabinet temperature is between the set temperature(St) and the temperature of the set temperature(St) +hysteresis(C1), if the refrigeration is closed, then after finishing compressor start Min. interval and Max.standby time after finishing compressor start Min. interval(C7), the refrigeration will start.
Note: Compressor start Min.interval is calculated by Compressor initial start Min. interval (C3) after it is electrified for the first time, and it will be calculated by Compressor start Min. interval (C2) in the future.
Cabinet temperature sensor failure:
A1=0, cancel the function of "Run/stop in a proportional time", the compressor closes;
A1=1, open the function of "Run/stop in a proportional time", the compressor will run in cycle according to the proportion (Refrigeration running time A3 and refrigeration stop time A2).

9.2 Defrost
1) d4 = 0, Defrost is forbidden.
2) d4 ≠ 0, when it is not in the state of defrost nor defrost dripping:
① Evaporator sensor is enabled (d1 = 1), and evaporator sensor temperature is higher than Defrost termination temperature (d7), then defrost could not be started.
② Evaporator sensor is enabled (d1 = 1) and evaporator sensor temperature is lower than Defrost termination temperature (d7) or evaporator sensor is disabled (d1 = 0) (Any of the following conditions could start defrost):
a、When defrost cycle (d4) finishes running, defrost is started;
Note: Defrost cycle is calculated according to the selected natural time (d3 = 1) or accumulated refrigeration time (d3 = 0);
b、Hold and press for three seconds, start defrost;
c、If the door switch is as synchronous signal input of defrost (d01 = 4) ,the door open is the external synchronous defrost signal, the defrost is started.
Note: When finish time delay after defrost start (d10), there will be an output of defrost.
3) In the state of defrost (Any of the following condition could close defrost):
① Evaporator sensor is enabled (d1 = 1), and evaporator sensor temperature is higher than defrost termination temperature (d7), defrost is closed;
② When finish running the maximum time of defrost (d6), defrost is closed;
③ Hold and press for three seconds, defrost is closed;
4) After defrost, it enters the state of defrost dripping, and within dripping time after defrost(d8), refrigeration output is forbidden. The dripping will be discharged during this time period.After finishing dripping time after defrost, it enters to the status of refrigeration cycle.
Note: Defrost status display
d5=0: Display cabinet temperature
d5=1:Display dEF during defrost and defrost time delay, display cabinet temperature after finishing defrost time delay.
d5=2:Always display dEF during defrost and defrost dripping
d5=3:Always display start defrost cabinet temperature during defrost and defrost dripping
Defrost type:
d11=0:Electric heating defrost
d11=1:Hot gas defrost

9.3 Fan:
Fan running mode:
F1 = 0: Fan and compressor run or stop synchronically;
F1 = 1: Fan runs continuously, stops during defrost;
F1 = 2: Fan runs continuously, stops during defrost and defrost dripping;
F1 = 3: Fan runs continuously, stops during defrost, fan starts when finish time delay after defrost(F3);
F1 = 4: Controlled by defrost sensor temperature, and it stops during defrosting[defrost sensor temperature >Fan working highest temperature(F5)、defrost sensor temperature < Fan working lowest temperature (F4)、defrost sensor failure、defrost sensor is forbidden (d1=0)、controller in the status of defrosting).
When the door switch parameter is selected as 1 or 3, when the cabinet door is open, fan will be close. And when the door is closed, fan will recover to the working state before door open.
Note: Fan will not be permitted to run until finish Fan initial start time delay after electrified (F2).

9.4 Light
do1=0 or 1 or 4: press to open the light, and press again to close the light.
do1=2 or 3: When door open, the light will be opened, and when close the door, light will be closed.
Note: A12 = 0, Light/Alarm relay will be used as light relay, and light relay will pick-up when the light opens, disconnect when the light closes.

9.5 Internal Alarm
Temperature sensor failure alarm:
When cabinet sensor fails, the digital tube display E1;
When evaporator sensor fails, the digital tube display E2;
When condenser sensor fails, the digital tube display E3;
Condenser high temperature alarm: If the condenser sensor is selected, when the condenser temperature is higher than the condenser high temperature alarm start value, it will alarm and display cH. While it will not have an effect on the control output. When the temperature falls back to (the condenser high temperature alarm value-condenser high temperature alarm lower hysteresis), the alarm is released.
Cabinet over temperature alarm: When the cabinet temperature is higher than the cabinet temperature upper limit alarm value(A11=0) or higher than (set value + over temperature alarm upper deviation: A11=1), and cabinet over temperature alarm time delay or the initial cabinet over temperature alarm time delay after electrified has been finished, the digital tube will display rH, and the alarm will not be released until the temperature is lower than the cabinet temperature upper limit alarm value(A11=0) or lower than (set value+ over temperature alarm upper deviation: A11=1); When the cabinet temperature is lower than the cabinet temperature lower limit alarm value (A11=0) or lower than [set value- over temperature alarm lower deviation: A11=1), and cabinet over temperature alarm time delay or the initial cabinet over temperature alarm time delay after electrified has been finished, the digital tube will display rL, and the alarm will not be released until the temperature is higher than the cabinet temperature lower limit alarm value or (set value- over temperature alarm lower deviation: A11=1).
If the buzzer is selected as 1(A4=1), when there is alarm, door open(do2 is set as 1), the buzzer beeps;
When all alarm is released and door is closed(do2 is set as 1), the buzzer mutes, or press any key to mute the alarm.

Alarm code	Alarm reason
E1	Cabinet temperature sensor failure
E2	Evaporator sensor failure
E3	Condenser sensor failure
cH	Condenser high temperature alarm
rH	Cabinet high temperature alarm
rL	Cabinet low temperature alarm
Er	Copy card programming failure
EP	Inconsistent data between copy card and controller, programming failure

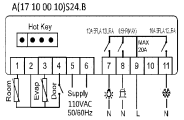
9.6 External alarm output (A12=1)
The external alarm relay will pick up when there is alarm or door is open (do2 is set as 1), and it will disconnect when all alarm is released and the door is closed (do2 is set as 1).

9.7 The table of controller output status

System status \ Defrost type	Electric heating defrost	Hot gas defrost
Refrigeration output	Compressor start	Compressor start
	Electric heating close	Four-valves close
Defrost time delay	Compressor stop	Compressor stop
	Electric heating close	Four-valves open
Defrost output	Compressor stop	Compressor start
	Electric heating open	Four-valves open
Defrost dripping	Compressor stop	Compressor stop
	Electric heating close	Four-valves open

10. Wiring diagram Refer to the actual product.

A(17 10 00 10)S24.B



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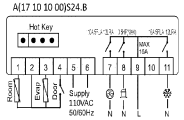

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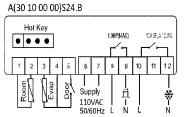

11. Safety rules:
★Danger:
1. Strictly distinguish the power wire, relay output, sensor down-lead and data line, and the relay could not be overloaded.
2. Prohibit connecting the wire terminals without electricity cut-off.
★Warning:
Prohibit using this unit under the environment of over damp, high temp., strong electromagnetism interference or strong corrosion.
★Notice:
1. The power supply should conform to the voltage value indicated in the instruction, and make sure a steady power supply.
2. To avoid the possible interference, the sensor down-lead/data line and power wire should be kept in a proper distance.
3. When evaporator sensor is installed, the sensor should be well connected with the copper tube which is 5cm away from evaporator inlet.

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