



The table below describes the files that were selected to be included as part of this package.

Supplements, such as Figures and Illustrations, will appear as X number of Figures, X number of Illustrations, etc., rather than naming each one.

E489087-20190920-TestRecord
E489087-20190920-Description
Figure-18-Total
Illustration-6-Total

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TEST RECORD NO. 1

SAMPLES:

Samples of the Exit Sign, Models CR-7082RX, CR-7082GX, as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

GENERAL:

Tests conducted with specific models represent other models as tabulated in datasheet.

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

The following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
BATTERY DISCHARGE CURRENT MEASUREMENT (Reference only):	-	-
LUMINANCE MEASUREMENT TEST:	43.3	-
NON-ENERGIZED CONTRAST DETERMINATION TEST:	43.4.1	-
EMERGENCY LIGHTING CONTROL FUNCTIONALITY (ELCF) TESTS:	47	-
BATTERY DISCHARGE TEST:	48	-
MAXIMUM LOAD VERIFICATION: (For Reference Only):	48.6c, 54.1, 78.2.1	-
INPUT TEST:	49	-
LOW VOLTAGE, LIMITED ENERGY CIRCUIT DETERMINATION:	50	-
TEMPERATURE TEST:	52	7.5
OVERVOLTAGE WITHSTAND TEST:	53	-
UNDERVOLTAGE RECHARGE CAPABILITY TEST	54	-
VOLTAGE SURGE TEST:	55	-
DIELECTRIC VOLTAGE WITHSTAND TEST: (DIELECTRIC STRENGTH)	56	7.7

(Cont'd)

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
CONDUCTOR SECURENESS TEST:	60	-
SECURITY OF KNOCKOUTS TEST:	64	-
SWIVEL TORSION AND PULL TEST:	65	-
COMPONENT BREAKDOWN TEST:	66	8.4.4
Resistance to IMPACT TEST	10.2	-
MOLD STRESS RELIEF DISTORTION TEST:	10.2	-
MECHANICAL SUPPORT STATIC LOAD TEST:	69	-
BARRIER STRENGTH TEST:	70	-
MINIMUM LIGHT OUTPUT TEST:	SG3	Annex C
GENERAL TEST NOTE FOR CSA	-	7.1 / 7.2 / 7.3
RATING (INPUT) AND CHARGING MEANS TEST:	-	7.4 / 7.9
SHORT-TERM RECOVERY TEST:	-	7.8
CYCLING TEST:	-	7.10
MINIMUM EXTREME VOLTAGE TEST:	-	7.12.1, 7.12.2
SWIVEL TEST:	-	7.17

The following tests were waived, since same battery packs have been tested previously:

Test	File Reference	Report Date	Test Record No.
FORCED DISCHARGE TEST:	E489087	2017-06-30	1
Short Circuit Test:	E489087	2017-06-30	1
Abnormal Charging Test:	E489087	2017-06-30	1

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2018-05-01
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

TEST RECORD NO. 2

SAMPLES:

Samples of the Exit Sign, Models CR-7088R/G, CR-7088R/G-RC, CR-7088R/G-AT, CR-7089R/G, CR-7089R/G-RC, CR-7089R/G-AT, as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

GENERAL:

Tests conducted with specific models represent other models as tabulated in datasheet.

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

The following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
LUMINANCE MEASUREMENT TEST:	43.3	-
NON-ENERGIZED CONTRAST DETERMINATION TEST:	43.4.1	-
EMERGENCY LIGHTING CONTROL FUNCTIONALITY (ELCF) TESTS:	47	-
BATTERY DISCHARGE TEST:	48	-
MAXIMUM LOAD VERIFICATION: (For Reference Only):	48.6c, 54.1, 78.2.1	-
INPUT TEST:	49	-
LOW VOLTAGE, LIMITED ENERGY CIRCUIT DETERMINATION:	50	-
TEMPERATURE TEST:	52	7.5
OVERVOLTAGE WITHSTAND TEST:	53	-
UNDERVOLTAGE RECHARGE CAPABILITY TEST	54	-
VOLTAGE SURGE TEST:	55	-
DIELECTRIC VOLTAGE WITHSTAND TEST: (DIELECTRIC STRENGTH)	56	7.7

(Cont'd)

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
CONDUCTOR SECURENESS TEST:	60	-
SECURITY OF KNOCKOUTS TEST:	64	-
SWIVEL TORSION AND PULL TEST:	65	-
COMPONENT BREAKDOWN TEST:	66	8.4.4
Resistance to IMPACT TEST	10.2	-
MOLD STRESS RELIEF DISTORTION TEST:	10.2	-
MECHANICAL SUPPORT STATIC LOAD TEST:	69	-
BARRIER STRENGTH TEST:	70	-
MINIMUM LIGHT OUTPUT TEST:	SG3	Annex C
GENERAL TEST NOTE FOR CSA	-	7.1 / 7.2 / 7.3
RATING (INPUT) AND CHARGING MEANS TEST:	-	7.4 / 7.9
SHORT-TERM RECOVERY TEST:	-	7.8
CYCLING TEST:	-	7.10
MINIMUM EXTREME VOLTAGE TEST:	-	7.12.1, 7.12.2
SWIVEL TEST:	-	7.17

The following tests were waived, since same battery packs have been tested previously:

Test	File Reference	Report Date	Test Record No.
FORCED DISCHARGE TEST:	E489087	2017-06-30	1
Short Circuit Test:	E489087	2017-06-30	1
Abnormal Charging Test:	E489087	2017-06-30	1

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2018-05-01
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

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Evaluated by:

Sking Zhou
Sr. Project Engineer

Reviewed by:

Tracy Huang
Sr. Project Engineer

TEST RECORD NO. 3

SAMPLES:

Samples of the Exit Sign, Models CR-7082RX, CR-7082GX, CR-7088R/G, CR-7088R/G-RC, CR-7088R/G-AT, CR-7089R/G, CR-7089R/G-RC, CR-7089R/G-AT alternate construction as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Alternate battery.

GENERAL:

Tests conducted with specific models represent other models as tabulated in datasheet.

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

The following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
BATTERY DISCHARGE TEST:	48	-
INPUT TEST:	49	-
TEMPERATURE TEST:	52	7.5
OVERVOLTAGE WITHSTAND TEST:	53	-
UNDERVOLTAGE RECHARGE CAPABILITY TEST	54	-
GENERAL TEST NOTE FOR CSA	-	7.1 / 7.2 / 7.3
RATING (INPUT) AND CHARGING MEANS TEST:	-	7.4 / 7.9
SHORT-TERM RECOVERY TEST:	-	7.8
CYCLING TEST:	-	7.10
MINIMUM EXTREME VOLTAGE TEST:	-	7.12.1, 7.12.2
SHORT CIRCUIT TEST (At Room Temperature):	22.2.1	-
SHORT CIRCUIT TEST (At 55C):	22.2.1	-
ABNORMAL CHARGING TEST:	22.2.1	-
FORCED DISCHARGE TEST:	22.2.1	-

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2018-05-01
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

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Evaluated by:

Alan Wang
Project Engineer

Reviewed by:

Sking Zhou
Engineering Leader

TEST RECORD NO. 4

SAMPLES:

Samples of the Exit Sign, new model CR-7085R/G construction as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

New model CR-7085R/G is similar to certificated model CR-7089R/G except for lamp heads.

GENERAL:

Tests conducted with specific models represent other models as tabulated in datasheet.

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

Based on previous evaluation, only the following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
MAXIMUM LOAD VERIFICATION: (For Reference Only):	48.6c, 54.1, 78.2.1	-
INPUT TEST:	49	-
SWIVEL TORSION AND PULL TEST:	65	-
Resistance to IMPACT TEST	10.2	-
MOLD STRESS RELIEF DISTORTION TEST:	10.2	-
MINIMUM LIGHT OUTPUT TEST:	SG3	Annex C
SWIVEL TEST:	-	7.17

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2020-05-05
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Evaluated by:

Peny Li(T)
Senior Project Engineer

Piero Ren
Associate Project Engineer

Reviewed by:

Tracy Huang
Senior Project Engineer

TEST RECORD NO. 5

SAMPLES:

Samples of the Exit Sign, new model CR-7105R/G construction as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

New model CR-7105R/G is similar to certificated model CR-7085R/G except for lamp heads.

GENERAL:

Tests conducted with specific models represent other models as tabulated in datasheet.

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

Based on previous evaluation, only the following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
MAXIMUM LOAD VERIFICATION: (For Reference Only):	48.6c, 54.1, 78.2.1	-
INPUT TEST:	49	-
SWIVEL TORSION AND PULL TEST:	65	-
Resistance to IMPACT TEST	10.2	-
MOLD STRESS RELIEF DISTORTION TEST:	10.2	-
MINIMUM LIGHT OUTPUT TEST:	SG3	Annex C
SWIVEL TEST:	-	7.17

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2020-05-05
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Evaluated by:

Robbin Shi(T)
Project EngineerPiero Ren
Project Engineer

Reviewed by:

Alan Wang
Senior Project Engineer

TEST RECORD NO. 6

SAMPLES:

Samples of the models as indicated below and constructed as described herein, were submitted by the manufacturer for examination and test.

- 1) Add new models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG - EXIT Signs.
- 2) Revised the RTI of internal wiring from 105°C to be 80°C for all models which had been evaluated in "E489087, Vol. 1, Sec. 9, Test Record No. 1 to 5" and including the new models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG this time. According to engineering judgments, no tests were considered necessary.

GENERAL:

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

Tests conducted with specific models represent other models as tabulated below:

Model Tested	Tests Conducted	Represents Model	Rationale
CR-7111SR	BATTERY DISCHARGE TEST; UNDERVOLTAGE RECHARGE CAPABILITY TEST; RATING (INPUT) AND CHARGING MEANS TEST; SHORT TERM RECOVERY TEST; CYCLING TEST; MINIMUM EXTREME VOLTAGE TEST; MECHANICAL SUPPORT STATIC LOAD TEST	CR-7111CR, CR-7111CG, CR-7111SG	Same electrical schematic and driver PWB layout, same battery, the tested model has higher battery output current, similar input current and similar enclosure and construction
CR-7111SG	TEMPERATURE TEST; OVERVOLTAGE WITHSTAND TEST	CR-7111SR, CR-7111CR, CR-7111CG,	Same electrical schematic and driver PWB layout, same battery, the tested model has higher input wattage, similar input current and similar enclosure and construction
CR-7111SG	SPRINKLER / RAIN TESTS;	CR-7111SR	Same enclosure and construction
CR-7111CG	Resistance to IMPACT TEST	CR-7111CR	
CR-7111SR	SWIVEL TORSION AND PULL TEST;	CR-7111SG	
CR-7111CR	SWIVEL TEST; MOLD STRESS RELIEF DISTORTION TEST	CR-7111CG	
CR-7111SG	LUMINANCE MEASUREMENT TEST;	CR-7111CG	Same LEDs, same battery, similar lamp enclosure
CR-7111SR	NON-ENERGIZED CONTRAST DETERMINATION TEST	CR-7111CR	

The following tests were conducted:

MAXIMUM LOAD VERIFICATION: (FOR REFERENCE ONLY):	UL 924, CLAUSES 48.6C, 54.1, 78.2.1
BATTERY DISCHARGE TEST (for model CR-7111SR only)	UL 924; 48
INPUT TEST:	UL 924; 49
TEMPERATURE TEST: (for model CR-7111SG only)	UL 924, SEC. 52
OVERVOLTAGE WITHSTAND TEST: (for model CR-7111SG only)	UL 924, SEC. 53
UNDERVOLTAGE RECHARGE CAPABILITY TEST (for model CR-7111SR only)	UL 924, SEC. 54
SPRINKLER / RAIN TESTS (for models CR-7111SG, CR-7111CG only)	UL 924, SC4.5, SC4.6
MINIMUM LIGHT OUTPUT TEST	UL 924; SG2 CSA C22.2 No. 141-15 Annex C; C.2
GENERAL TEST NOTE FOR CSA	C22.2 NO. 141-15
RATING (INPUT) AND CHARGING MEANS TEST: (for model CR-7111SR only)	CSA C22.2 NO. 141-15, 7.4 / 7.9
SHORT TERM RECOVERY TEST: (for model CR-7111SR only)	CSA C22.2 NO. 141-15, 7.8
CYCLING TEST: (for model CR-7111SR only)	CSA C22.2 NO. 141-15, 7.10
MINIMUM EXTREME VOLTAGE TEST: (for model CR-7111SR only)	CSA C22.2 NO. 141-15; 7.12.1, 7.12.2
Resistance to IMPACT TEST: (for models CR-7111SG, CR-7111CG only)	UL924 (UL746C)
SWIVEL TORSION AND PULL TEST (for models CR-7111SR, CR-7111CR only)	UL 924, Sec. 65
SWIVEL TEST (for models CR-7111SR, CR-7111CR only)	CSA C22.2 No. 141-15; 7.17
MOLD STRESS RELIEF DISTORTION TEST: (for models CR-7111SR, CR-7111CR only)	UL924 (UL746C)
MECHANICAL SUPPORT STATIC LOAD TEST (for model CR-7111SR only)	UL 924; 69
LUMINANCE MEASUREMENT TEST (for models CR-7111SG, CR-7111SR only)	UL 924; 43.3
NON-ENERGIZED CONTRAST DETERMINATION TEST (for models CR-7111SG, CR-7111SR only)	UL 924; 43.4.1

The test methods and results of the above tests have been reviewed and found in accordance with the requirements.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2022-12-14
CSA C.22.2 No. 141	Emergency Lighting Equipment	5 th	2015-06-01

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Evaluated by:

Michael Zhai (T)/Robbin Shi
Senior Project Engineer/Senior Project
Engineer
UL-CCIC Suzhou

Preliminary & Final Reviewed by:

Alan Wang
Senior Project Engineer
UL-CCIC Suzhou

TEST RECORD NO. 7

SAMPLES:

Samples of the models as indicated below and constructed as described herein, was submitted by the manufacturer for examination and test.

Alternate model CR-7088RG-RC which is similar to certificated model CR-7085R/G-RC except for LED Printed Circuit Board.

Alternate model CR-7085RG which is similar to certificated model CR-7085R/G except for LED Printed Circuit Board.

GENERAL:

Tests conducted in accordance with UL 924, The Standard for Emergency Lighting and Power Equipment were considered representative of the same tests required by CSA C22.2 No.141.

Based on previous evaluation, only the following tests were conducted:

TESTS	Clause No.	
	UL 924	CSA C22.2 No. 141
MAXIMUM LOAD VERIFICATION: (For Reference Only):	48.6c, 54.1, 78.2.1	-
INPUT TEST:	49	-
MINIMUM LIGHT OUTPUT TEST:	SG3	Annex C
LUMINANCE MEASUREMENT TEST	UL 924; 43.3	-
NON ENERGIZED CONTRAST DETERMINATION TEST	UL 924; 43.4.1	-

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the standards noted below and, therefore, such products are judged eligible to bear UL's Mark as described on the Conclusion Page of this Report.

Standard	Title	Edition or Publication Date	Revision Date
UL 924	Emergency Lighting and Power Equipment	10 th	2022-12-14
CSA C.22.2 No. 141	Unit Equipment for Emergency Lighting	5 th	2015-06-01

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Evaluated by:

Robbin Shi
Senior Project Engineer

Reviewed by:

Alan Wang
Senior Project Engineer

CONCLUSION

Samples of the products covered by this Report have been found to comply with the requirements covering the category and the products are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the samples investigated by UL and does not signify UL certification or that the products described are covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the UL Listing Mark on such products which comply with UL's Follow-Up Service Procedure and any other applicable requirements of UL LLC. The Listing Mark of UL LLC on the product, or the UL symbol on the product and the Listing Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Listing and Follow-Up Service.

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Evaluated by:

Sking Zhou
Sr. Project Engineer

Preliminary Reviewed by:

Tracy Huang
Sr. Project Engineer

Final Reviewed by:

Tracy Huang
Sr. Project Engineer

File E489087

Project 4788947947

September 20, 2019

REPORT

On

EMERGENCY LIGHTING AND POWER EQUIPMENT

NINGBO CHANGRONG LIGHTING & ELECTRONICS TECHNOLOGY CO LTD
ZHEJIANG, China

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DESCRIPTION

PRODUCT COVERED:

EXIT Signs

USL, CNL, Models see below RATINGS TABLE for details.

TECHNICAL CONSIDERATIONS: (NOT FOR FIELD REPRESENTATIVE'S USE)

USL - Products designated USL have been investigated using US requirements as noted in the Test Record.

CNL - Products designated CNL have been investigated using Canadian requirements as noted in the Test Record.

RATINGS TABLE:

Model Designation	Input Ratings				Emergency Output Rating		Emergency Run Time	Recharge Time
	Vac	Hz	Amps (mA)	Watts	<u>Integral</u>	<u>Remote</u>	Minutes	Hours
CR-7082RX, CR-7082GX	120/ 277	60	100	1.2	2.8W	NA	90	24
CR-7088R/G	120/ 277	60	150	2.0	4.8W	NA	90	24
CR-7088R/G- RC, CR- 7088RG-RC	120/ 277	60	150	2.0	4.8W	5W	90	24
CR-7088R/G- AT	120/ 277	60	150	2.0	4.8W	NA	90	24
CR-7089R/G	120/ 277	60	150	2.0	2.8W	NA	90	24
CR-7089R/G- RC	120/ 277	60	150	2.0	2.8W	5W	90	24
CR-7089R/G- AT	120/ 277	60	150	2.0	2.8W	NA	90	24
CR-7085R/G, CR-7105R/G, CR-7085RG	120/ 277	60	150	2.0	2.8W	NA	90	24
CR-7111CR, CR-7111CG	120/ 277	60	150	2.0	2.8W	NA	90	24
CR-7111SR, CR-7111SG	120/ 277	60	150	2.0	4.8W	NA	90	24

NOTES:

The total output load rating for any equipment is the sum of its integral and remote ratings. A remote output rating of "NA" signifies a unit has NO provisions for remote loads.

<u>Model Designation</u>	<u>Battery Life Expectancy (in years)</u>
CR-7082RX, CR-7082GX	4
CR-7088R/G, CR-7088R/G-RC, CR-7088R/G-AT, CR-7089R/G, CR-7089R/G-RC, CR-7089R/G-AT, CR-7085R/G, CR-7105R/G, CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG	4
CR-7088RG-RC, CR-7085RG	4

CONSTRUCTION DETAILS:

GENERAL - These requirements, in conjunction with applicable requirements in the Section General, apply to all products covered by this report unless the individual product descriptions specify otherwise.

1. SPACINGS - The following min spacings shall be maintained throughout the equipment:

Min spacing required, in inches(mm) between uninsulated live parts and -		0 - 50 V rms (a)	51 - 150 V rms (a)	151-300 V rms (a)	301-600 V rms (a)
Uninsulated Live parts Of opposite Polarity	Through Air:	1/16 (b) (1.6)	1/8 (c) (3.2)	1/4 (6.4)	3/8 (9.5)
	Over Surface:	1/16 (b) (1.6)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
Uninsulated, grounded Dead metal other than Enclosure, or exposed Dead metal that is isolated (insulated)	Through Air:	1/16 (b) (1.6)	1/8 (c) (3.2)	1/4 (6.4)	3/8 (9.5)
	Over Surface:	1/16 (b) (1.6)	1/4 (6.4)	3/8 (9.5)	1/2 (12.7)
Wall of the Metal enclosure, Including conduit And/or armored Cable fittings (d)	Through Air:	1/4 (6.4)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	Over Surface:	1/4 (6.4)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

- (a) For peak and battery voltages, multiply applicable rms voltage by the square root of 2.
- (b) The spacing between installation-wiring terminals of opposite polarity and between a wiring terminal and a grounded dead metal part shall not be less than 1/8 in (3.2mm) through air and 1/4 in (6.4mm) over surface.
- (c) The spacing between installation-wiring terminals of opposite polarity and between a wiring terminal and a grounded dead metal part shall not be less than 1/4 in (6.4mm).
- (d) A metal piece attached to a metal enclosure is considered to be a part of the enclosure if deformation of enclosure is likely to reduce spacings.

2. SPACINGS ON PRINTED CIRCUIT BOARDS - The spacings between tracks on a printed wiring board shall be as specified by their individual descriptions. Spacings between live parts on any PCB and any other live or dead metal parts shall comply with the SPACINGS table.
3. CORROSION PROTECTION - All iron and steel parts shall be suitably painted or plated to resist corrosion. All battery compartments housing wet cell batteries shall be coated with an acid resistant paint.
4. MOUNTING OF PARTS - All components are secured and prevented from loosening or turning by rivets and/or screws, lock washers and/or nuts or locknuts. All mounting hardware is metal unless otherwise specified.
5. TOLERANCES - All dimensions are nominal, unless otherwise defined in this report.
6. INSULATING TUBING - If employed, and unless otherwise described, shall be R/C Tubing, Electrical (YDPU2) or Tubing, Processed (YDRY2), rated min. 105°C, 600V, with a minimum recovered wall thickness of 1/32 in (0.8mm).
7. CIRCUIT BREAKERS - When employed and mounted vertically, the switch shall be in the "ON" position when up.
8. INSTALLATION AND INTERNAL WIRING - Unless otherwise described in report:
 - a) All installation wiring shall be R/C Appliance Wiring Material (AVLV2), min 18 AWG, having thermoplastic insulation not less than 1/16 in (0.38mm) thick, rated min 105°C, 300 VAC. All other internal wiring shall also be rated min 105°C, 300 VAC, unless otherwise described.
 - b) Installation leads shall be long enough to extend 6 in (152mm) past the center of the equipment's junction box pattern. If conduit knockouts are the only wiring means provided, then the leads shall have at least 6 in (152mm) of free length.
 - c) All internal wiring shall be terminated by one of the following methods:
 1. Listed crimp-on closed-loop pressure terminal connectors
 2. Listed crimp-on spade-type pressure terminal connectors with upturned ends
 3. R/C (RFWV2) crimp-on quick-connect type terminals
 4. Solder connections which are mechanically secured before soldering, or splices be made with Listed fixture type splicing connectors, insulated pressure cable connectors, or equivalent.
 - d) All internal wiring shall be routed away from sharp edges and moving parts and secured every 3 in (76.2mm).

EXIT LEGENDS AND DIRECTIONAL INDICATORS:

1. EXIT LEGEND - As outlined below in inches (mm). The letter height may be larger only if ALL the other dimensions increase proportionately:

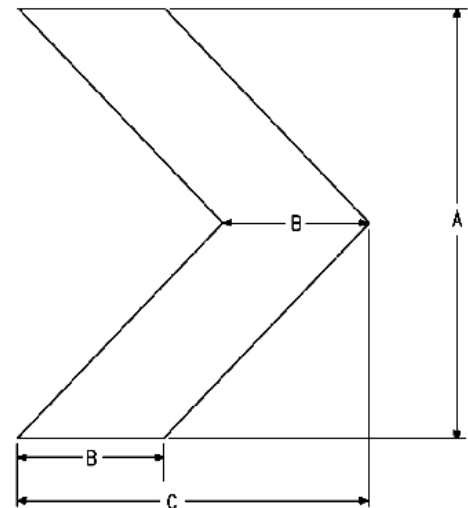
Letter height:	6 (152)
Letter width (except I):	Min 2 (51)
Letter stroke:	Min 3/4 (19)
Spacing between letters:	Min 3/8 (10)

2. DIRECTIONAL INDICATORS - When provided, they shall be:

- of the "Chevron" type: < and/or > ,
- positioned on either side of the legend,
- centered vertically with respect to the legend,
- spaced at least 3/8 inch (10mm) from the nearest legend character,
- conform to the following dimensions in inches (mm):

A - Height:	1.25 (31.8)
B - Horiz Stroke:	0.42 (10.8)
C - Width:	1.04 (26.5)

The dimensions may be larger than those stated above, but ONLY if so described in this report.



S3380B

MARKINGS:

The word "CAUTION" shall appear in capital letters no less than 1/8 inch (3.2mm) high wherever the word is required unless otherwise specified.

Product markings, instruction manuals, and other literature for the equipment shall not claim that it can be used in any way that conflicts with the markings and instructions specified in this report.

When a marking is required to be visible after installation, the marking shall be on the exterior surface at a location where it will be visible after the equipment is installed or on the inside of a door or cover. A marking that becomes visible when a cover or trim of the enclosure, a lamp lens, a diffuser, or a similar part is removed, without disassembling or removing a component or device, is considered visible after installation.

The following markings, in conjunction with those in the Section General, shall be permanently marked on each unit in a location that is readily visible after installation and during routine maintenance:

These markings apply to all units, except as follows:

- (U) - Required only on units with UL Mark
- (C) - Required only on units with c-UL Mark

All units shall be marked as follows:

- a) Listee's (or Recognized Company's) name or trademark
- b) A distinctive catalog number
- c) A date code, as specified in the Section General
- d) Rated voltage and frequency
- e) Amperes or watts for equipment with power factor of 0.9 or greater
- f) Amperes or BOTH watts and power factor for all other equipment.
Power factor is assumed to be lagging unless marked leading.
- g) Number of phases or wires (if other than single phase)

Units provided with batteries, and/or with provisions for field battery wiring, shall be marked to specify the rated emergency operating time, as noted in the RATINGS section of this report.

All exit fixtures with two or more sets of free input leads shall be marked "For connection to a single source of supply such that all lamps are simultaneously illuminated", unless this marking appears in the instruction manual.

"CAUTION - see instruction manual for installation, operating, and maintenance instructions" or equivalent.

(U) Equipment with more than one input shall be marked "CAUTION - This equipment has more than one power supply connection point. To reduce the risk of electric shock disconnect both the branch circuit-breakers or fuses and emergency power supplies before servicing".

(U) Equipment provided with batteries, and/or with provisions for field battery wiring, shall be marked "CAUTION: Replace battery with _____ part number _____". The first blank is to be filled with the manufacturer's ID and the second with the catalog designation, as described in this report. This marking shall be located on the unit where visible during battery replacement. A marking that appears only on the battery is not sufficient.

(U) Model ___CR-7082RX, CR-7082GX ___ shall be marked "Max. mounting height: 13.8 ft (4.1 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7088R/G, CR-7088R/G-RC, CR-7088R/G-AT, CR-7089R/G, CR-7089R/G-RC, CR-7089R/G-AT shall be marked "Max. mounting height: 15.6 ft (4.7 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7085R/G shall be marked "Max. mounting height: 7.5 ft (2.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7105R/G shall be marked "Max. mounting height: 18.2 ft (5.5 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7111CR, CR-7111CG shall be marked "Max. mounting height: 12.3 ft (3.7 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7111SR, CR-7111SG shall be marked "Max. mounting height: 10.9 ft (3.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7088RG-RC shall be marked "Max. mounting height: 14.2 ft (4.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

(U) Model CR-7085RG shall be marked "Max. mounting height: 7.2 ft (2.2 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

*

(U) Equipment shall be marked "Use flexible conduit only" or equivalent where visible during installation.

(C) Units shall have a permanent marking adjacent to the battery identifying the replacement battery type.

(C) The battery compartment shall be marked with the following:

CAUTION: REPLACE BATTERY ONLY WITH _____

ATTENTION: REMPLACER LA BATTERIE UNIQUEMENT PAR UNE BATTERIE _____

(C) The battery shall be permanently marked with the model number and the month and year of its replacement date. The replacement date shall be the date of manufacture of the battery plus its design life expectancy, as specified by this report.

*

ADDITIONAL MARKINGS (AMBIENT TEMPERATURES):

Equipment that has been investigated and found suitable for use in extended ambient conditions is permitted to be marked "Suitable for use in 0 °C to 40 °C ambient temperatures", or equivalent, with the blanks filled in with the minimum and maximum permitted temperatures based on the tests conducted.

ADDITIONAL MARKINGS (DAMP LOCATION EQUIPMENT):

General - These additional markings shall be visible after installation.

"Suitable for use in damp locations" (for all models except CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG)

"Suitable for wet locations" (For models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG only)

"For side wall installation only" (for models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG only)

"For covered ceiling installation only" (for models CR-7111CR, CR-7111CG only)

INSTRUCTION MANUAL:

Safety Instructions:

An instruction manual shall be provided with all equipment. The manual shall include the following safety instructions verbatim.

The instructions "IMPORTANT SAFEGUARDS", "READ AND FOLLOW ALL SAFETY INSTRUCTIONS", and "SAVE THESE INSTRUCTIONS" shall be printed in block letters, not less than 3/16 inch (4.8mm) high. For all other instructions, upper case letters shall be at least 1/12 inch (2.1mm) high and lower case letters shall be at least 1/16 inch (1.6mm) high:

IMPORTANT SAFEGUARDS

When using electrical equipment, basic safety precautions should always be followed including the following:

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

- Do not use outdoors (**for all models except CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG**).
- Do not mount near gas or electric heaters.
- Use caution when servicing batteries. Battery acid can cause burns to skin and eyes. If acid is spilled on skin or eyes, flush acid with fresh water and contact a physician immediately.
- Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than its intended use.

SAVE THESE INSTRUCTIONS

Other instructions:

The manual shall include instructions for installation, operation, and maintenance recommended by the manufacturer. The instructions shall warn the user that all servicing should be performed by qualified personnel.

The instructions for all Model(s) shall indicate, both verbally and pictorially, that the equipment is intended for connection to flexible conduit only. (i.e.: "flexible conduit only" and/or "no rigid conduit", located next to pictogram) This shall appear in the IMPORTANT SAFEGUARDS page of the instructions.

Model CR-7082RX, CR-7082GX shall be marked "Max. mounting height: 13.8 ft (4.1 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7088R/G, CR-7088R/G-RC, CR-7088R/G-AT, CR-7089R/G, CR-7089R/G-RC, CR-7089R/G-AT shall be marked "Max. mounting height: 15.6 ft (4.7 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7085R/G shall be marked "Max. mounting height: 7.5 ft (2.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7105R/G shall be marked "Max. mounting height: 18.2 ft (5.5 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7111CR, CR-7111CG shall be marked "Max. mounting height: 12.3 ft (3.7 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7111SR, CR-7111SG shall be marked "Max. mounting height: 10.9 ft (3.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7088RG-RC shall be marked "Max. mounting height: 14.2 ft (4.3 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Model CR-7085RG shall be marked "Max. mounting height: 7.2 ft (2.2 m)" or the equivalent. This marking shall be on the packaging, in the installation instructions, and on the product in a location visible during installation.

Models CR-7082RX, CR-7082GX - Figs. 1 Thru. 6

General - Model CR-7082RX also represents CR-7082GX, except as noted otherwise. All dimensions are nominal, unless otherwise described.

1. Canopy Assembly - Assembly used for mounting. Refer to Fig. 2 for details. Consists of the following, see ILL. 1 for detailed dimensions.
 - a. Crossbar - Corrosion protected steel, min 1.5 mm thick; provided with two threaded openings for securement to canopy, four openings for mounting screw passage and openings for lead passage; secured to canopy by two screws.
 - b. Canopy - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with opening for lead passage; Provided with two tabs for engagement main housing.
2. Enclosure - Consists of three parts, Main housing, face plate and back plate, R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, secured together by physical fit, see ILL. 2 for detailed dimensions.

Main Housing - Enclosed and supported live parts; provided with integral channels/ projection for engagement of components and lead routing; side provided with openings for engagement of LED indicator light and test switch; top surface provided with opening for engagement of canopy, when unit is not intended for use with canopy openings are closed via integral cover plates; front and back perimeters are provided with (4) tabs for engagement of back plate and face plate.

Face Plate - Cut EXIT shape and sized to conform with main housing; perimeter provided with (4) openings which engage tabs on main housing.

Back Plate - Sized to conform with main housing; perimeter provided with (4) openings which engage tabs on main housing, also provided with knockout type opening for mounting use.

3. Plate for EXIT - Constructed of any R/C (QMFZ2) plastic, rated minimum HB, 80°C, measured 0.48 mm thick; fluorescent red or green in color; sized to cover EXIT legend and directional indicators on face plate; secured to face plate by twelve integral tabs.

4. LED Printed Circuit Board - Located in LVLE circuit, Consist of below components. Refer to Ill. 3 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, **80°C**.
- a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 23 by 2.7 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. LED (For model CR-7082GX) - Green Version. (6) Kong Lighting Technology Ltd, type KL-5BPGW3GB0-503, each rated 20mA, 2.6-3.2V; soldered to LED PCB such that normal 32.5 mm spacing is maintained between adjacent LEDs.

LED (For model CR-7082RX) - Red Version. (6) HARVATEK OPTOELECTRONICS (SHENZHEN) CO LTD, type F5D04R-4A, each rated 20mA, 1.8-2.4V; soldered to LED PCB such that normal 32.5 mm spacing is maintained between adjacent LEDs.
 - d. LED Indicator - (Red Version) - Rated 1.8~2.2V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.
*
 - e. Test Switch - Located in LVLE circuit, rated 1 A, 60 V, mechanically secured and soldered to PCB.
 - f. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, for LED lamp assembly connection, all mechanically secured and soldered to PCB.
 - g. Wire Connector - Two provided. R/C (ECBT2), CN, YUEQING CHANGSHUN ELECTRONICS CO LTD (E238126), Type CS25002-A, CS25002-Y, rated 2 A, 250 V, 65°C, for battery connection and main PCB connection, mechanically secured and soldered to PCB.

5. Battery - Nickel cadmium type, consisting of three cells, connection in series. Each cell rated 1.2V, 1000mAh, R/C (BBET2), RONDA GROUP CO LTD (MH29216), type RD1000AA. Total 3.6V, 1000mAh, Secured within main housing by main housing integral projections, connected with PWB by lead wiring and connector.

Alternate - Battery - Same as above, except for each cell rated 1.2V, 1000mAh, R/C (BBET2), JYH TECHNOLOGY CO LTD (MH46886), type AA1000. Total 3.6V, 1000mAh

6. Main Printed Circuit Board - Consist of below components. Refer to Ill. 4 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing. Connected to LED PCB by connector and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, **80°C**.
 - a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 6.9 by 5.1 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. Wire Connector - One provided. R/C (ECBT2), CN, YUEQING CHANGSHUN ELECTRONICS CO LTD (E238126), Type CS25002-A, CS25002-Y, rated 2 A, 250 V, 65°C, for LED PWB connection, mechanically secured and soldered to PCB.
7. Input Lead - Three Provided, R/C (AVLV2, AVLV8), minimum 18 AWG, 600V, 105°C, secured on PWB by soldering after mechanically secured, white color is neutral, black color is line of 120V, Red color is line of 277V.

8. LED Lamp Assembly - Two Provided. Each consists of six parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs and Swivel Connector, described as below. See ILL. 5 for detailed dimensions and LED lamp PWB layout.
 - a. Lamp Enclosure - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with integrally molded step for swivel connector and integrally molded ribs for adjustment; secured to swivel connector by snap-fit.
 - b. Reflector - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6600(Y), rated V-0, 120°C, min 1.8 mm thick, plated with aluminum for all surface, provided with integral projections for LED PWB mounting.
 - c. Lens - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to lamp enclosure by snap-fit.
 - d. LED PWB - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 6.4 by 5.5 cm. Secured to reflector by screws.
 - e. LEDs - (6) Tongling Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.
 - f. Swivel Connector - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and enclosure.
9. Lamp Assembly Adjustment Arm - Two provided. R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, shaped as shown, see ILL. 6 for detailed dimensions; provided with opening for lead passage and engagement of swivel connector, secured to main housing by physical fit.
10. See Ill. 7 for installation instruction.

Models CR-7088R/G, CR-7088R/G-RC - Figs. 7 Thru. 11

General - Model CR-7088R/G also represents CR-7088R/G-RC, except as noted otherwise. All dimensions are nominal, unless otherwise described.

1. Canopy Assembly - Assembly used for mounting. Refer to Fig. 7 for details. Consists of the following, see ILL. 8 for detailed dimensions.

- a. Crossbar - Corrosion protected steel, min 1.5 mm thick; provided with two threaded openings for securement to canopy, four openings for mounting screw passage and openings for lead passage; secured to canopy by two screws.
- b. Canopy - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with opening for lead passage; Provided with two tabs for engagement main housing.

2. Enclosure - Consists of three parts, Main housing, face plate and back plate, R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, secured together by physical fit, see ILL. 9 for detailed dimensions.

Main Housing - Enclosed and supported live parts; provided with integral channels/ projection for engagement of components and lead routing; below side provided with openings for engagement of LED indicator light and test switch; top surface provided with opening for engagement of canopy, when unit is not intended for use with canopy openings are closed via integral cover plates; front and back perimeters are provided with (4) tabs for engagement of back plate and face plate.

Face Plate - Cut EXIT shape and sized to conform with main housing; perimeter provided with (4) openings which engage tabs on main housing.

Back Plate - Sized to conform with main housing; perimeter provided with (4) openings which engage tabs on main housing, also provided with knockout type opening for mounting use.

3. Plate for EXIT - Constructed of any R/C (QMFZ2) plastic, rated minimum HB, 80°C, measured 0.48 mm thick; fluorescent red in color; sized to cover EXIT legend and directional indicators on face plate; secured to face plate by ten integral tabs.

4. LED Printed Circuit Board for CR-7088R/G, CR-7088R/G-RC - Located in LVLE circuit, Consist of below components. Refer to Ill. 10 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, **80°C**.
- a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 25.8 by 2.6 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. LED - Red Version. (9) Hangzhou Qiguang Electronics Technology CO LTD, type 504FRWD-F10, each rated 20mA, 2.1-2.4V; soldered to LED PCB such that normal 16 mm spacing is maintained between adjacent LEDs.
 - d. LED Indicator - (Red Version) - Rated 1.8~2.2V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.
*
 - e. Test Switch - Located in LVLE circuit, rated 1 A, 60 V, mechanically secured and soldered to PCB.
 - f. Wire Connector - Four provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, two for LED lamp assembly connection, one for battery connection, one for main PWB connection, all mechanically secured and soldered to PCB.
 - g. Wire Connector for CR-7088R/G-RC only - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, mechanically secured and soldered on PCB, for remote load capability connection.

5. Battery for CR-7088R/G - Nickel cadmium type, consisting of three cells, connection in series. Each cell rated 1.2V, 1000mAh, R/C (BBET2), RONDA GROUP CO LTD (MH29216), type RD1000AA. Total 3.6V, 1000mAh, Secured within enclosure by physical fit, connected with PWB by lead wiring and connector.

Alternate - Battery for CR-7088R/G - Same as above, except for each cell rated 1.2V, 1000mAh, R/C (BBET2), JYH TECHNOLOGY CO LTD (MH46886), type AA1000. Total 3.6V, 1000mAh.

Battery for CR-7088R/G-RC - NI-MH type, consisting of three cells, connection in series. Each cell rated at 1.2V, 1800mAh, R/C (BBET2), RONDA GROUP CO LTD (MH29216), type RD1800AA, total 3.6V, 1800mAh, Secured within enclosure by physical fit, connected with PWB by lead wiring and connector. Alternate - Battery for CR-7088R/G-RC - Same as above, except for each cell rated at 1.2V, 1800mAh, R/C (BBET2), JYH TECHNOLOGY CO LTD (MH46886), type AA1800, total 3.6V, 1800mAh.

6. Main Printed Circuit Board - Consist of below components. Refer to Ill. 11 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing. Connected to LED PCB by connector and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, **80°C**.
 - a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 3.0 by 5.0 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. Wire Connector - One provided. R/C (ECBT2), CN, YUEQING CHANGSHUN ELECTRONICS CO LTD (E238126), Type CS25002-A, CS25002-Y, rated 2 A, 250 V, 65°C, for LED PWB connection, mechanically secured and soldered to PCB.
 - d. Fuse - Listed (JDYX, JDYX7), rated 1A, 350V, provided with integral pigtailed to mechanically secured and solder on PWB connected in series with ungrounded supply.
7. Input Lead - Three Provided, R/C (AVLV2, AVLV8), minimum 18 AWG, 600V, 105°C, secured on PWB by soldering after mechanically secured, white color is neutral, black color is line of 120V, orange color is line of 277V.

8. LED Lamp Assembly - Two Provided. Each consists of six parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs and Swivel Connector, described as below. See ILL. 12 for detailed dimensions and LED lamp PWB layout.
 - a. Lamp Enclosure - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with integrally molded step for swivel connector and integrally molded ribs for adjustment; secured to swivel connector by snap-fit.
 - b. Reflector - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6600(Y), rated V-0, 120°C, min 1.8 mm thick, plated with aluminum for all surface, provided with integral projections for LED PWB mounting.
 - c. Lens - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to lamp enclosure by snap-fit.
 - d. LED PWB - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 6.2 by 5.2 cm. Secured to reflector by screws.
 - e. LEDs - (12) Tongling Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.
 - f. Swivel Connector - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and enclosure.
9. Lamp Assembly Adjustment Arm - Two provided. R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, shaped as shown, see ILL. 13 for detailed dimensions; provided with opening for lead passage and engagement of swivel connector, secured to main housing by physical fit.
10. See Ill. 14 for installation instruction.

Model CR-7088R/G-AT - Fig. 12

General - Model CR-7088R/G-AT is identical to CR-7088R/G, except noted as below. All dimensions are nominal, unless otherwise described.

4. LED Printed Circuit Board - Located in LVLE circuit, Consist of below components. Refer to Ill. 15 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, **80°C**.
 - a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 25.8 by 2.6 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. LED - Red Version. (9) Hangzhou Qiguang Electronics Technology CO LTD, type 504FRWD-F10, each rated 20mA, 2.1-2.4V; soldered to LED PCB such that normal 16 mm spacing is maintained between adjacent LEDs.
 - d. LED Indicator - (Red Version) - Rated 1.8~2.2V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.
*
 - e. Test Switch - Located in LVLE circuit, rated 1 A, 60 V, mechanically secured and soldered to PCB.
 - f. Wire Connector - Four provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, two for LED lamp assembly connection, one for battery connection, one for main PWB connection, all mechanically secured and soldered to PCB.

Models CR-7089R/G, CR-7089R/G-RC CR-7089R/G-AT - Figs. 13 and 14

General - Models CR-7089R/G, CR-7089R/G-RC CR-7089R/G-AT are identical to CR-7088R/G, CR-7088R/G-RC CR-7088R/G-AT respectively, except noted as below. All dimensions are nominal, unless otherwise described.

8. LED Lamp Assembly - Two Provided. Each consists of six parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs and Swivel Connector, described as below. See ILL. 16 for detailed dimensions and LED lamp PWB layout.
 - a. Lamp Enclosure - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with integrally molded step for swivel connector and integrally molded ribs for adjustment; secured to swivel connector by snap-fit.
 - b. Reflector - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6600(Y), rated V-0, 120°C, min 1.8 mm thick, plated with aluminum for all surface, provided with integral projections for LED PWB mounting.
 - c. Lens - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to lamp enclosure by snap-fit.
 - d. LED PWB - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 5.0 mm OD. Secured to reflector by screws.
 - e. LEDs - (7) Tongling Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.
 - f. Swivel Connector - R/C (QMFZ2) LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and enclosure.
9. Lamp Assembly Adjustment Arm - Two provided. R/C (QMFZ2) LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, shaped as shown, see ILL. 17 for detailed dimensions; provided with opening for lead passage and engagement of swivel connector, secured to main housing by physical fit.

Model CR-7085R/G - Figs. 15 and 16

General - Model CR-7085R/G is identical to CR-7089R/G except noted as below. All dimensions are nominal, unless otherwise described.

8. LED Lamp Assembly - Two Provided. Each consists of six parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs and Swivel Connector, described as below. See ILL. 18 for detailed dimensions and LED lamp PWB layout.
 - a. Lamp Enclosure - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, provided with integrally molded step for swivel connector and integrally molded ribs for adjustment; secured to swivel connector by snap-fit.
 - b. Reflector - R/C (QMFZ2), ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6600(Y), rated V-0, 120°C, min 1.8 mm thick, plated with aluminum for all surface, provided with integral projections for LED PWB mounting.
 - c. Lens - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to lamp enclosure by snap-fit.
 - d. LED PWB - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 55mm x 16mm (L x W). Secured to reflector by screws.
 - e. LEDs - (12) TongLing Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.
 - f. Swivel Connector - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and enclosure.
9. Lamp Assembly Adjustment Arm - Two provided. R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick, shaped as shown, see ILL. 19 for detailed dimensions; provided with opening for lead passage and engagement of swivel connector, secured to main housing by physical fit.

Model CR-7105R/G - Figs. 17 and 18

General - Model CR-7105R/G is identical to CR-7089R/G except noted as below. All dimensions are nominal, unless otherwise described.

8. LED Lamp Assembly - Two Provided. Each consists of eight parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs and Swivel Connector, described as below. See ILL. 20 for detailed dimensions and LED lamp PWB layout.
 - a. Lamp Enclosure - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick. Consists of two parts, Top Lamp Enclosure and Bottom Lamp Enclosure, secured together by physical fit. Entirety secured to Main Housing by snap-fit.
 - b. Swivel Connector - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and enclosure. Secured to Lamp Enclosure by snap-fit
 - c. Swivel Enclosure - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. B4235+, rated 5VA, 130°C, min 1.5 mm thick. includes mechanical stop to limit lamp assembly rotation to 360 degrees. Secured to Swivel Connector by snap-fit.
 - d. Outer Lens - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to lamp enclosure by snap-fit.
 - e. Center Lens - R/C (QMFZ2), LANXESS AG (E245249), Cat. No. TP153-005+(f2), rated 5VA, 115°C, min 1.5 mm thick; secured to Outer Lens by snap-fit.
 - f. LED PWB - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 31.5mm x 28.5mm (L x W). Secured to Outer Lens by physical fit.
 - g. LEDs - (1 provided) Nantong Laishida Optoelectronic Technology Co., Ltd., type HY-ADT1P1ZWA, each rated 300mA, 3.0-3.4V.
 - h. SMD Resistor - Two provided. R3: Rated 1206, 5.6R, 1/4W; R4: Rated 1206, 5.1R, 1/4W.

Models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG - Figs. 19 thru 26

General - Models CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG are respectively identical to CR-7089R/G which was described on page 18 except for the differences noted as below. All dimensions are nominal, unless otherwise described.

1. Canopy Assembly - Assembly used for mounting. Refer to Fig. 20 for details. Consists of the following, see ILL. 21 for detailed dimensions.

- a. Crossbar - Corrosion protected steel, min. 1.5 mm thick; provided with two threaded openings for securement to canopy, eight openings for mounting screw passage and openings for lead passage; secured to canopy by two screws.
- b. Canopy - R/C (QMFZ2), ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-110N(f1) (a), PC-6610(f1) (a), rated 5VA, f1, 120 C, min. 3.0 mm thick, provided with opening for lead passage; use two nuts and a pipe nipple for engagement of main housing.

2. Enclosure - Consists of six parts, Main Housing, Front Cover, Face Plate, Back Plate, Gasket and Switch Cover. R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-110N(f1) (a), PC-6610(f1) (a), rated 5VA, f1, 120 C, min. 3.0 mm thick, secured together by physical fit, see ILL. 22 for detailed dimensions.

Main Housing - Enclosed and supported live parts; provided with integral channels/ projection for engagement of components and lead routing; below side provided with openings for engagement of LED indicator light and test switch; top side provided with two openings for engagement LED Lamp Assembly; both top side and right side provided with knockout type opening for engagement of canopy; front and back perimeters are provided with 4 screw holes for engagement of Front Cover and Back Plate.

Front Cover - Sized to conform with Main Housing; perimeter provided with 4 openings which secured on Main Housing by screws.

Face Plate - Cut EXIT shape and sized to conform with main housing; sandwiched between Front Cover and Main Housing. Also provided directional indicators cover secured on directional openings of Face Plate when unit is not intended to indication.

Back Plate - Sized to conform with main housing; perimeter provided with 4 openings which secured on Main Housing by screws, also provided with knockout type opening for mounting use.

Gasket - Silicone, min. 3.0 mm thick, secured to the top side and bottom side slot of Main Housing by snap-fit.

Switch Cover - Silicone, min. 1.2 mm thick, secured to the opening of Main Housing by snap-fit.

Adhesive - R/C, (QMFZ2) GUANGDONG HENGDA NEW MATERIALS TECHNOLOGY CO LTD (E335921), Cat. No. K-5915, K-5916, K-5906Z, K-5206, K-5515, rated V-0, 105°C. Used between Switch Cover and Main Housing as auxiliary water shield.

3. Plate for EXIT - Constructed of any R/C (QMFZ2) plastic, rated minimum HB, 80°C, measured 0.5 mm thick; fluorescent red or green in color; sized to cover EXIT legend and directional indicators on Face Plate; secured to face plate by nine integral tabs.

4. LED Printed Circuit Board for CR-7111CR, CR-7111CG, CR-7111SR, CR-7111SG - Located in LVLE circuit, Consist of below components. Refer to ILL. 23 for bill of material, circuit diagram (not for the field representatives' use) (same as that in ILL. 10) and PCB trace layout (same as that in ILL. 10); Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min. 22 AWG, 300V, 80°C.

a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 25.8 by 2.6 cm.

b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.

c. LED for CR-7111CR and CR-7111SR - Red Version. (9 provided) Hangzhou Qiguang Electronic Technology Co LTD, type 504FRWD-F10, each rated 20mA, 1.9-2.4V; soldered to LED PCB such that normal min 17 mm spacing is maintained between adjacent LEDs.

LED for CR-7111CG and CR-7111SG - Green Version. (9 provided) Shenzhen Hongdali New Energy Materials Co LTD, type 5G2CH/503, each rated 20mA, 3.0-3.4V; soldered to LED PCB such that normal min 17 mm spacing is maintained between adjacent LEDs.

d. LED Indicator - (Red Version) - Rated 1.8-2.4V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.

e. Test Switch - Located in LVLE circuit, rated 0.1 A, 12 V, mechanically secured and soldered to PCB.

f. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, for LED lamp assembly connection, all mechanically secured and soldered to PCB.

g. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2500X-YYY Housing, and HX2500X-YYY Wafer, rated 3 A, 250 V, 85°C, one for battery connection, one for main PWB connection, all mechanically secured and soldered on PCB.

5. Battery - Nickel cadmium type, consisting of three cells, connection in series. Each cell rated 1.2V, 1000mAh, R/C (BBET2), JYH TECHNOLOGY CO LTD (MH46886), type AA1000. Total 3.6V, 1000mAh, secured within enclosure by physical fit, connected with PWB by lead wiring and connector.

8. LED Lamp Assembly - Two Provided. Each consists of seven parts, Lamp Enclosure, reflector, Lens, LED PWB, LEDs, Rotor Bracket and Gasket, described as below. For models CR-7111CR, CR-7111CG, see ILL. 24 for detailed dimensions and LED lamp PWB layout. For models CR-7111SR, CR-7111SG, see ILL. 25 for detailed dimensions and LED lamp PWB layout.

a. Lamp Enclosure - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-110N(f1) (a), PC-6610(f1) (a), rated 5VA, f1, 120 C, min 3.0 mm thick, secured to Lamp Assembly Adjustment Arm by snap-fit.

b. Reflector - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6600(Y), rated V-0, 120°C, min 1.8 mm thick, plated with aluminum for all surface, provided with integral projections for LED PWB mounting.

c. Lens - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-6610(f1) (a), rated 5VA, f1, 120 C, min 3.0 mm thick; secured to Lamp Enclosure by screws.

d. LED PWB for CR-7111SR and CR-7111SG - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 81 by 52 mm. Secured to reflector by screws.

LED PWB for CR-7111CR and CR-7111CG - R/C (ZPMV2), rated V-0, 105°C minimum. Overall measures 50.2 mm OD. Secured to reflector by screws.

e. LEDs for CR-7111SR and CR-7111SG - (12) Tongling Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.

LEDs for CR-7111CR and CR-7111CG- (7) Tongling Aladdin optoelectronic technology CO LTD, type 281WD5NZJN3F, each rated 60mA, 3.0-3.2V.

f. Rotor Bracket - R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-110N(f1) (a), PC-6610(f1) (a), rated 5VA, f1, 120 C, min 3.0 mm thick; includes mechanical stop to limit lamp assembly rotation to 360 degrees; provided with opening for lead passage and integral channels/ projections for engagement of lamp enclosure and main housing.

g. Gasket - Silicone, min 1.5 mm thick, secured to the opening of lamp enclosure by snap-fit.

9. Lamp Assembly Adjustment Arm - Two provided. R/C (QMFZ2) ZHEN JIANG CHI MEI CHEMICAL CO LTD (E194560), Cat. No. PC-110N(f1)(a), PC-6610(f1)(a), rated 5VA, f1, 120 C, min. 3.0 mm thick; shaped as shown, see ILL. 26 for detailed dimensions; provided with opening for lead passage and engagement of swivel connector, secured to rotor bracket by screws, and secured to main housing by gasket and Nut.
10. For CR-7111SR and CR-7111SG, See ILL. 27 for installation instruction. For CR-7111CR and CR-7111CG, See ILL. 28 for installation instruction.

Model CR-7088RG-RC - Figs. 27 Thru. 33

General - Model CR-7088RG-RC is identical to CR-7088R/G-RC except noted as below. All dimensions are nominal, unless otherwise described.

4. LED Printed Circuit Board - Located in LVLE circuit, Consist of below components. Refer to Ill. 29 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, 80°C.
 - a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 25.8 by 2.6 cm.
 - b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
 - c. LED - Red Version. (9 provided) Hangzhou Qiguang Electronics Technology CO LTD, type 504FRWD-F10, each rated 20mA, 1.9-2.4V; soldered to LED PCB such that normal min. 8 mm spacing is maintained between adjacent LEDs.
LED - Green Version. (9 provided) Shenzhen Hongdali New Energy Materials Co LTD, type 5G2CH/503, each rated 20mA, 3.0-3.4V; soldered to LED PCB such that normal min. 9 mm spacing is maintained between adjacent LEDs.
 - d. LED Indicator - (Red Version) - Rated 1.8~2.4V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.
 - e. Test Switch - Located in LVLE circuit, rated 0.1 A, **12 V**, mechanically secured and soldered to PCB.
 - f. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, for LED lamp assembly connection, all mechanically secured and soldered to PCB.
 - g. Wire Connector - Four provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2500X-YYY Housing, and HX2500X-YYY Wafer, rated 3 A, 250 V, 85°C, two for remote load capability connection, one for battery connection, one for main PWB connection, all mechanically secured and soldered on PCB.
10. See Ill. 31 for installation instruction.

Model CR-7085RG - Figs. 34 Thru. 40

General - Model CR-7085RG is identical to CR-7085R/G except noted as below.
All dimensions are nominal, unless otherwise described.

4. LED Printed Circuit Board - Located in LVLE circuit, Consist of below components. Refer to Ill. 30 for bill of material, circuit diagram and PCB trace layout; Secured within channels of main housing by projections. Connected to main PWB, battery, LED lamp assembly by connectors and internal wiring R/C (AVLV2, AVLV8) AWM leads, rated min 22 AWG, 300V, 80°C.

- a. Printed Circuit Board - R/C (ZPMV2), ANSI Grade FR-4, rated V-0, 130°C. Overall measures 25.8 by 2.6 cm.
- b. Conformal Coating - R/C (QMJU2), rated minimum 105°C, with ANSI Type FR-4 to match the ANSI Grade of the PCB applied to. Applied to the trace side of the PWB in accordance with the recognition.
- c. LED - Red Version. (9 provided) Hangzhou Qiguang Electronics Technology CO LTD, type 504FRWD-F10, each rated 20mA, 1.9-2.4V; soldered to LED PCB such that normal min. 8 mm spacing is maintained between adjacent LEDs.

LED - Green Version. (9 provided) Shenzhen Hongdali New Energy Materials Co LTD, type 5G2CH/503, each rated 20mA, 3.0-3.4V; soldered to LED PCB such that normal min. 9 mm spacing is maintained between adjacent LEDs.

- d. LED Indicator - (Red Version) - Rated 1.8~2.4V forward voltage, 20mA; integral leads mechanically secured and soldered to PCB. LED maintained within opening in main housing.
- e. Test Switch - Located in LVLE circuit, rated 0.1 A, **12 V**, mechanically secured and soldered to PCB.
- f. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2000X-YYY Housing, and HX2000X-YYY Wafer, rated 2 A, 250 V, 85°C, for LED lamp assembly connection, all mechanically secured and soldered to PCB.
- g. Wire Connector - Two provided. R/C (ECBT2, ECBT8), ZHEJIANG HONGXING ELECTRICAL CO LTD (E228500), Type HX2500X-YYY Housing, and HX2500X-YYY Wafer, rated 3 A, 250 V, 85°C, one for battery connection, one for main PWB connection, all mechanically secured and soldered on PCB.

10. See Ill. 32 for installation instruction.

Figure-1 Page-1



Figure-2 Page-1



Figure-3 Page-1

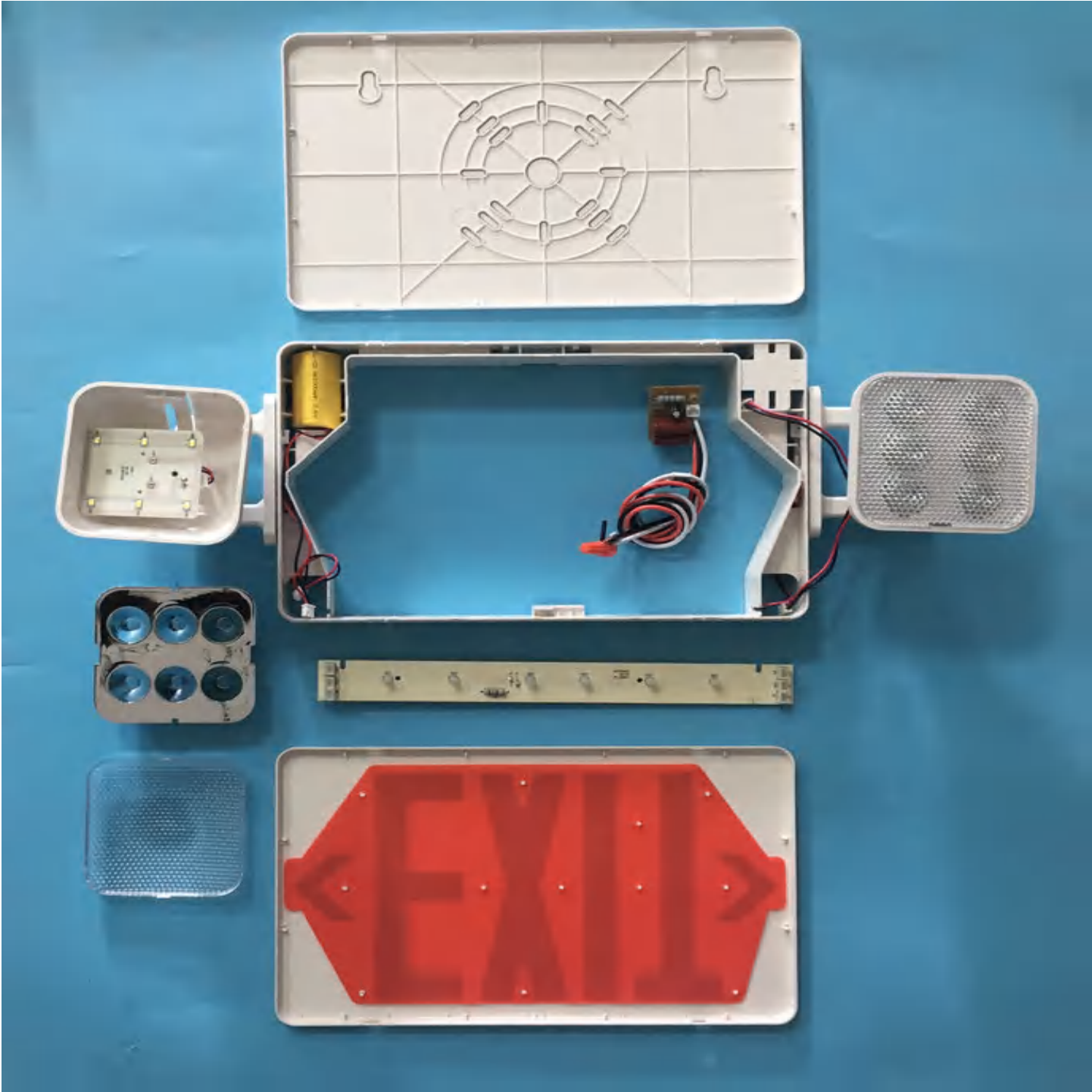


Figure-5 Page-1

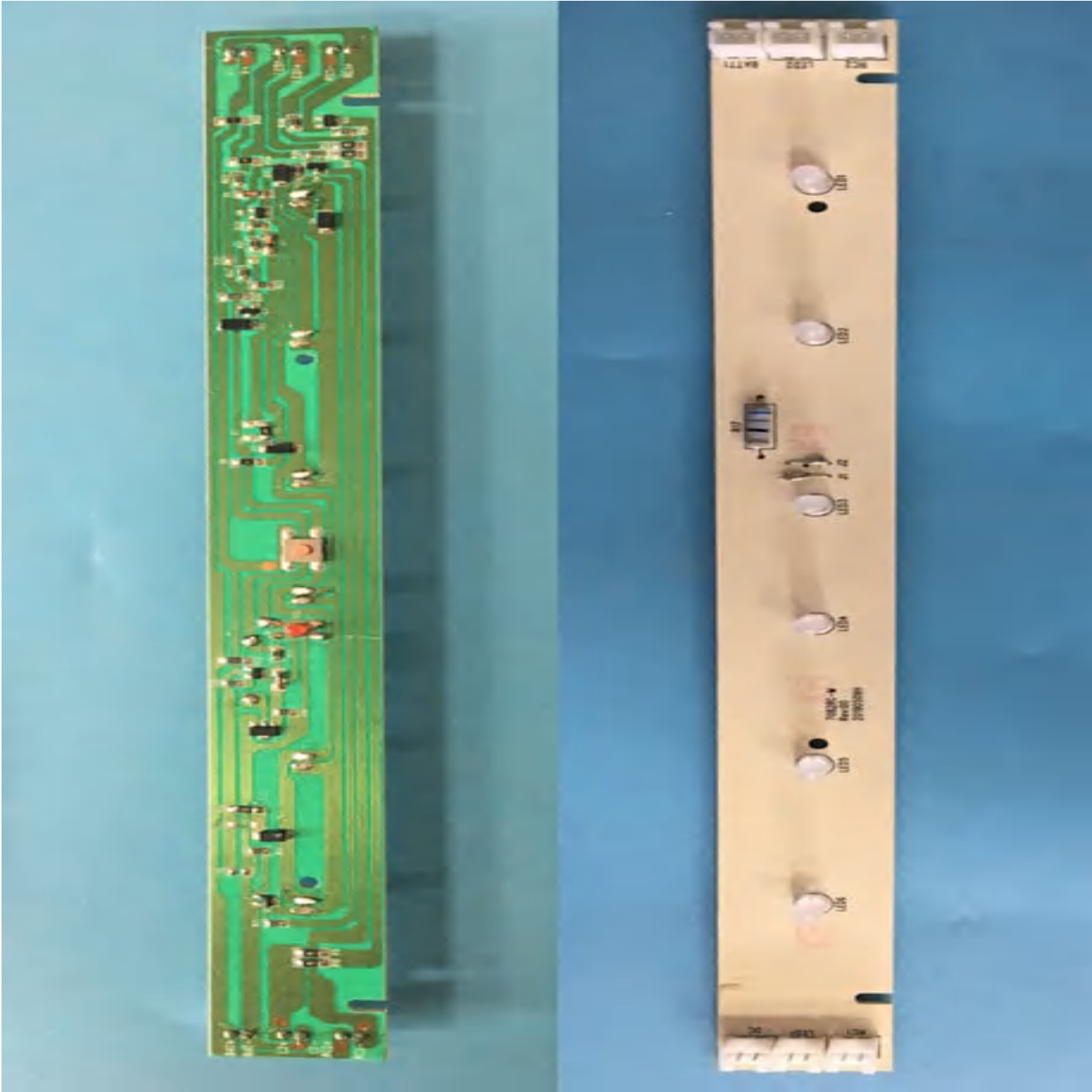


Figure-6 Page-1

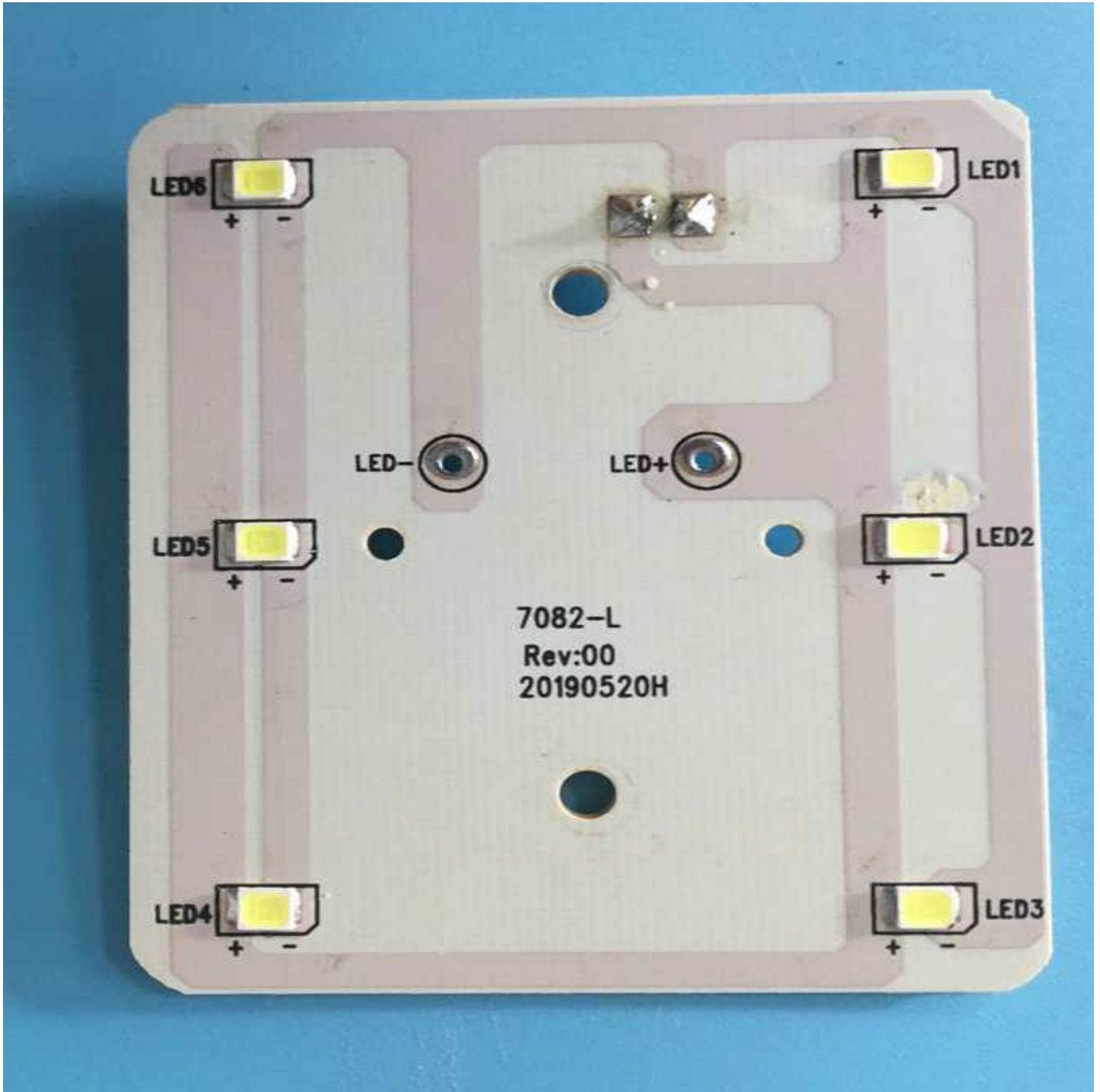


Figure-7 Page-1



Figure-13 Page-1



Figure-15 Page-1

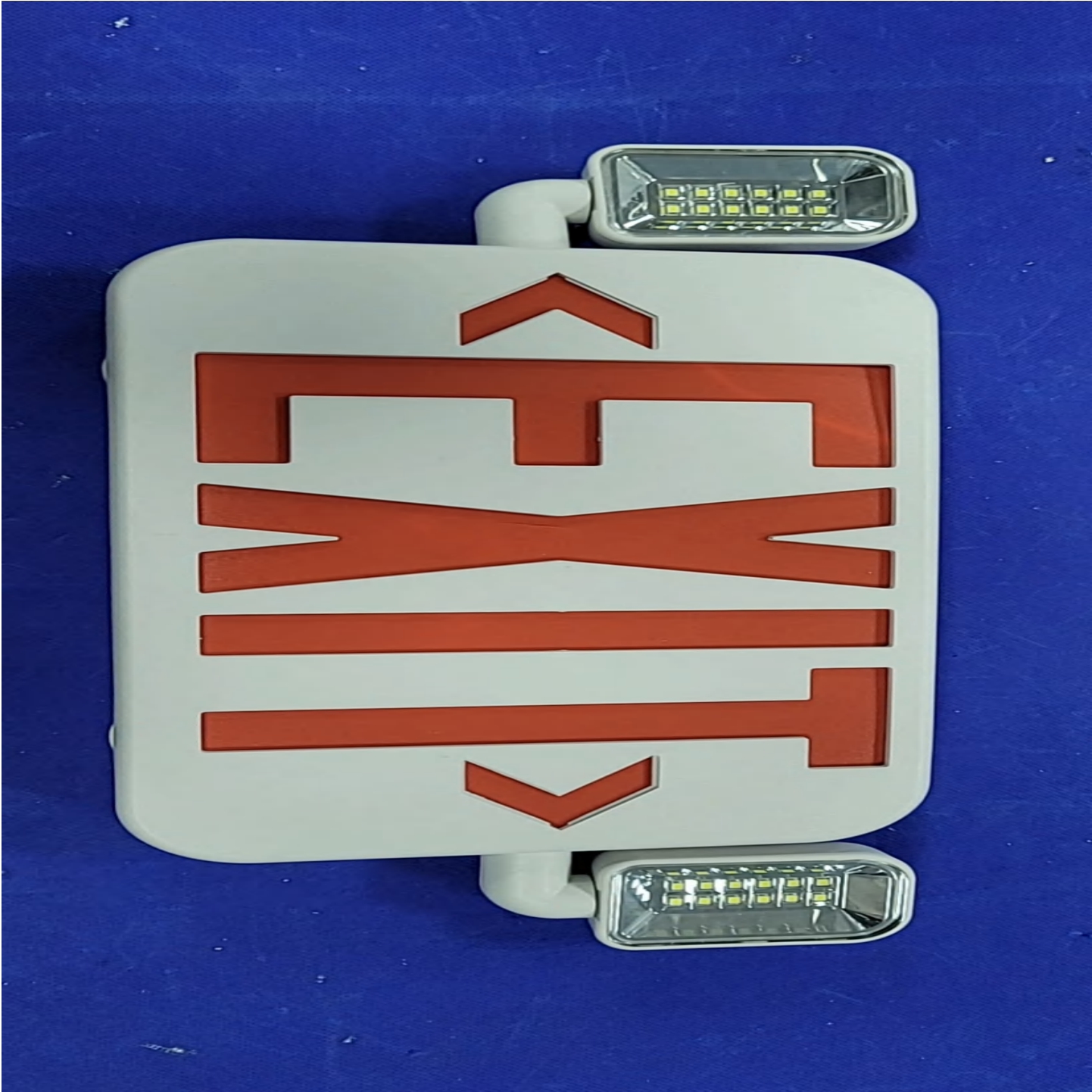


Figure-16 Page-1

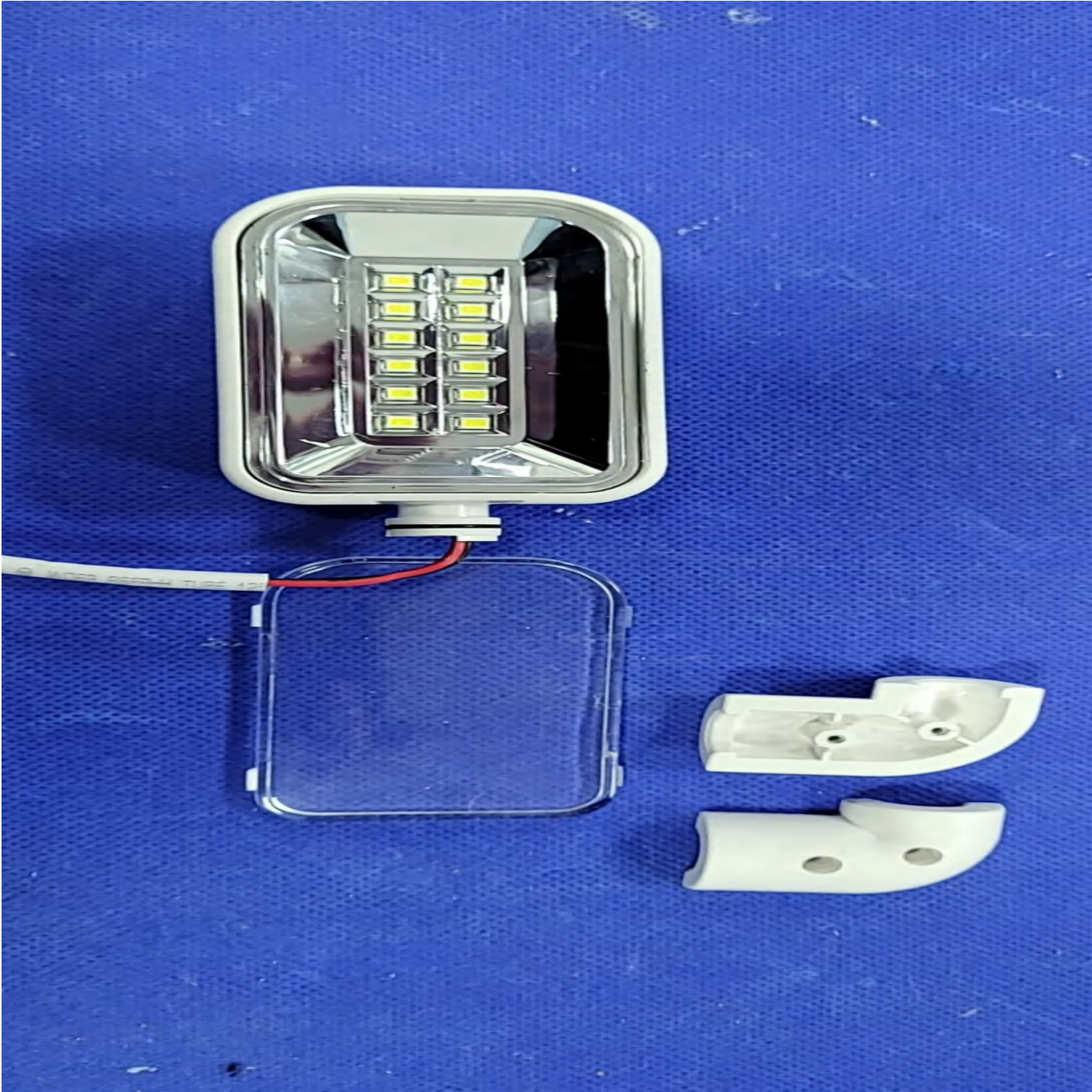


Figure-17 Page-1



Figure-19 Page-1



Figure-20 Page-1



Figure-21 Page-1



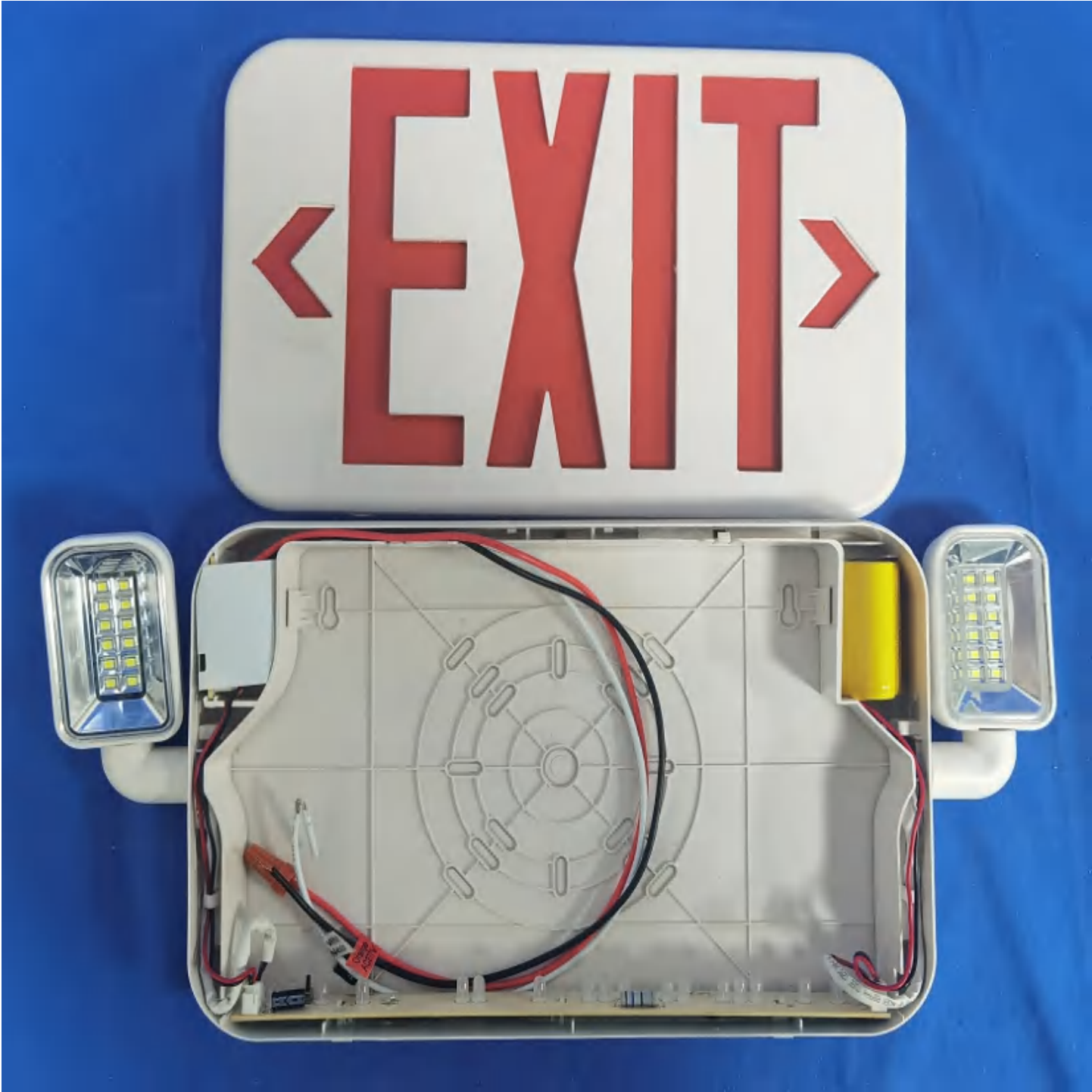
Figure-34 Page-1



Figure-35 Page-1



Figure-36 Page-1



The following Page(s) are related to Illustration-27. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

INSTALLATION INSTRUCTIONS FOR EMERGENCY LIGHTING

Package Contents

Part	Description	Quantity
1	Emergency Lighting	1
2	Hardware Kit	1



Warnings and Cautions

IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. Review the diagrams thoroughly before beginning.
2. All electrical connections must be in accordance with local codes, ordinances and the National Electric code.
3. Disconnect power at fuse or circuit breaker before installing or servicing.
4. Do not mount in hazardous locations, or near gas or electric heaters.
5. Do not let power cords touch hot surface.
6. Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
7. The use of accessory equipment not recommend by the manufacturer may cause an unsafe condition.
8. Do not use this equipment for other than intended use.
9. All servicing should be performed by qualified personnel only.
10. Allow battery to charge for 24 hours before first use.
11. Suitable for wet location. Max. mounting height: 10.9 ft (3.3m) .
12. For connection to a single source of supply such that all lamps are simultaneously illuminated.

SAVE THESE INSTRUCTIONS

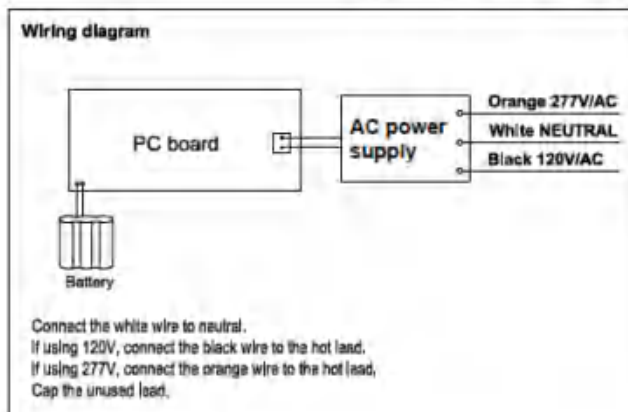
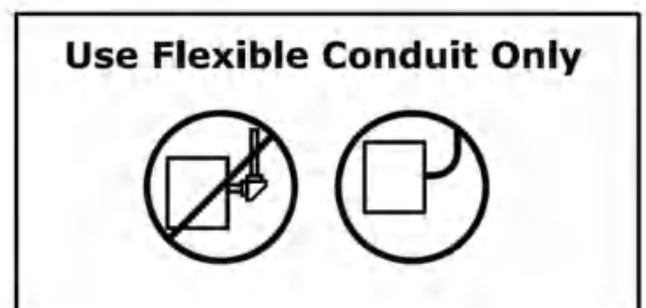


Figure 1



Mounting Instructions

Surface Wall Mounting

- If back mounting, skip to **next** section.
- Remove appropriate knockout by drilling a 3/4" hole.
- Thread nut onto pipe nipple. Slide pipe nipple through canopy center hole.
- Remove backing from self adhesive junction box gasket and adhere to back of mounting canopy. Remove backing from self adhesive pipe thread gasket and adhere to front of mounting canopy.
- Place the screws provided in the holes on the canopy.
- Feed the power supply through knockout, pipe, and metal mounting plate, as seen in "Figure 2 - Wall Mount." Direct input wires along walls of the fixture to protect the wires and prevent shadowing.
- Ensure that power is off, then connect the power supply, 120 or 277 VAC, to the appropriate input wires, using the provided wire nuts, according to the wiring diagram in Figure 1. The unused wire must be capped off using the extra wire nut.
- Push wire connections into the junction box. Mount metal bracket to junction box (J-box and hardware not included).
- Secure the canopy to the steel mounting plate. Place pipe nipple through the mounting hole of the housing to lock the canopy into place. Once canopy is locked into position there will not be any side-to-side movement of the canopy.
- Connect batteries to PC board using snap in connectors. Secure the faceplate(s) to the fixture: snap in the white faceplate, then screw on clear cover. Do not over tighten screws.

NOTE: Figure 3 shown as single face install, for double face: install additional EXIT faceplate.

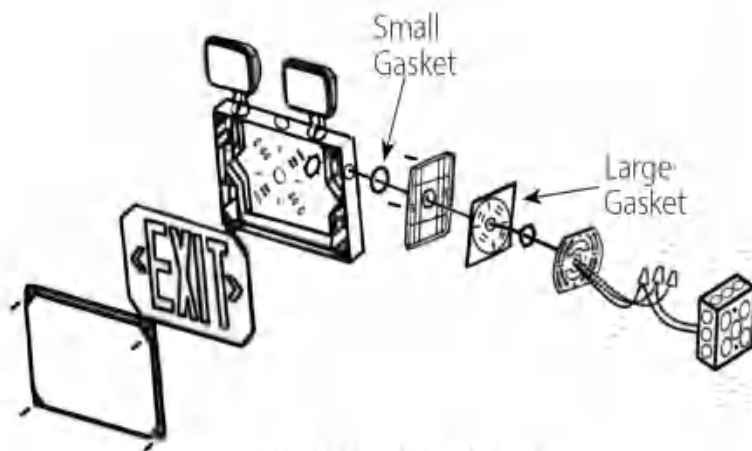


Figure 2 - Wall Mount

Back Mounting

- Drill or knock out appropriate knockouts on the backplate to fit junction box mounting points and the center knockout for the input wire leads.
- Remove backing from self adhesive junction box gasket and adhere to back plate.
- Feed the power supply through the knockout. Direct the input wires along the walls of the fixture to protect the wires and prevent shadowing. Run the wires through the mounting bracket as seen in Figure 3.
- Ensure that power is off, then connect the power supply, 120 or 277 Vac, to the appropriate input wires, using the provided wire nuts, according to the wiring diagram in Figure 1.
- Mount the metal bracket to the J-box (hardware not included).
- Using the provided (2) mounting screws, secure the fixture to the mounting bracket.
- Connect the battery to the **PC** board. Secure the faceplate to the fixture; snap in the white faceplate, then screw on clear cover. Do not over tighten the screws.

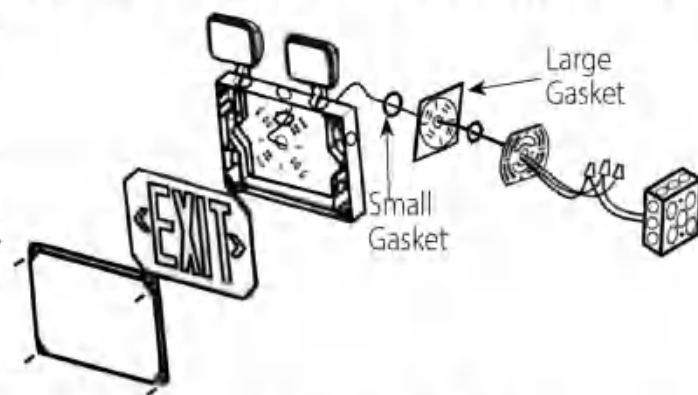


Figure 3 - Back Mount

NOTE

Battery Testing: Allow 24 hours of charging before testing.

- Push In TEST Button - LED display will switch to battery power and remain lit
- Release TEST Button - LED display will switch back to AC power

The following Page(s) are related to Illustration-28. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

INSTALLATION INSTRUCTIONS

IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. Review the diagrams thoroughly before beginning.
2. All electrical connections must be in accordance with local codes, ordinances, and the National Electric code.
3. Disconnect power at fuse or circuit breaker before installing or servicing.
4. Product suitable for outdoor installation when Installer properly seals all openings – mounting points, conduit, etc. – with appropriate sealant for wet installation applications.
5. Do not mount in hazardous locations, or near gas or electric heaters.
6. Do not let power cords touch hot surface. **Suitable for wet locations.**
7. Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
8. The use of accessory equipment not recommend by the manufacturer may cause an unsafe condition.
9. Do not use this equipment for other than intended use.
10. All servicing should be performed by a qualified personnel only.
11. Allow battery to charge for 24 hours before full duration test.
12. For connection to a single source of supply such that all lamps are simultaneously illuminated.

SAVE THESE INSTRUCTIONS

MAINTENANCE

Always disconnect power at fuse or circuit breaker before installing or servicing, servicing should be performed only by qualified personnel. BATTERY should be tested periodically and replaced when it no longer meet the required duration of 30 second or 90 minutes. Battery have to recharge if product keep in stock over 9 months, detail manual refer "BATTERY STOCK AND RECHARGE GUIDELINE".

OPERATION

1. Apply AC power to the unit, LED indicator light turn on.
2. Push the test switch, the LED indicator turns off and the LED board stays on .
3. Release the test switch,LED indicator will turn on.

TROUBLE SHOOTING GUIDE

If LED board or LED indicator does not illuminate, check the following:

1. Check AC supply - verify that unit has 24 hours AC supply.
2. Battery is not connected.
3. Battery voltage too low- Permit unit to charge for 24 hours then re-test.
4. If above trouble shooting hints do not solve the problem, contact us for assistance.

ROUTINE TESTING

National Electric Code (NEC) and NFPA life safety code regulations require that routine tests need to be performed as below:

Once every month, perform 30 seconds duration test, push in and hold the test switch to perform this test.

Once every 12 months, perform full 90 minutes test, disconnect AC power supply and transfer to emergency mode, the unit should stay on 90 minutes minimum.

MAX. MOUNTING HEIGHT: 12.3ft (3.7m)

Open front cover

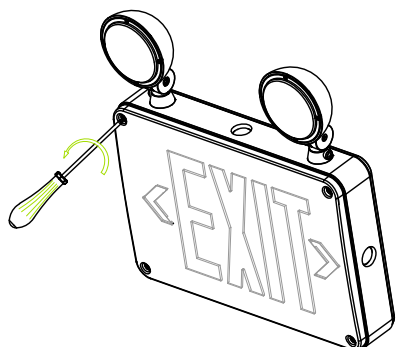
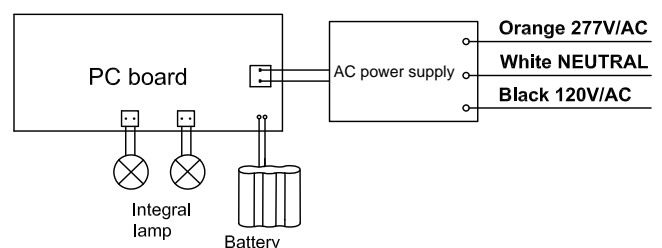


Fig 1

Wiring diagram



Connect the white wire to neutral.
If using 120V, connect the black wire to the hot lead.
If using 277V, connect the orange wire to the hot lead.
Cap the unused lead.

Wall Mounting (see Fig 2)

1. Open front cover by screwdriver (see Fig 1).
2. Knock out center and appropriate mounting screw holes on the back plate, paste gasket on back of back plate
3. Feed building power supply wires through the center hole, fix back plate to waterproof type junction box by screws.
4. Make correct electrical connections inside of fixture according wiring diagram.
5. Push excess wire into junction box.
6. Attach battery connector to PC board.
7. Snap chevron to EXIT panel if required, restore front panel on unit.

Side Mounting (see Fig 3)

1. Attach crossbar to J-box set the crossbar so that the longer blade is touching the waterproof type junction box.
2. Open front cover by screwdriver.
3. If double face is desired, replace back plate with additional face plate provided.
4. Knock out the mounting hole on the top or side of the unit, assemble the canopy on the unit (see Fig 5).
5. Route the proper wires through mounting hole out of housing .
6. Make electrical connections inside the J-box as wiring diagram.
7. Fasten crossbar on J-box by screws provided.
8. Paste gasket on canopy, then fasten canopy to crossbar and against to the wall.
8. Snap chevron to EXIT panel if required.
9. Attach battery connector to PC board, restore front panel on unit.

Ceiling suspend mount (see Fig 4)

1. Preinstall mounting conduit and fix waterproof type junction box on the mounting conduit (use local standard accessories).
 2. Rest install process refer to side mounting phase.
- The difference is wiring knock out hole is on the top of housing.
3. Sealed with silicone between conduit and J-box.

Connecting Remote heads (see Fig 4)

If fixture has remote capability option, Max. remote capability is 3.6VDC1.5W. Connect remote heads extension wire to remote wire, yellow is positive(+), purple is negative(-), connect wires using wire nuts.

Canopy assembly

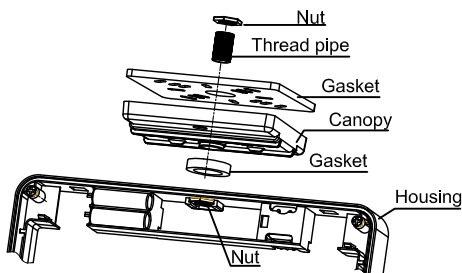


Fig 5

Use provided thread pipe and 2 nut fix canopy on unit, put gasket between unit and canopy.

Wall mount : See "Important Safeguards" for installations in outdoor applications

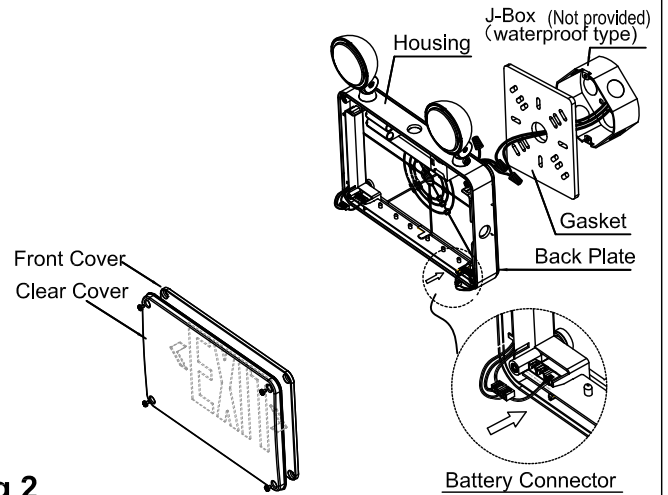


Fig 2

Side mount : See "Important Safeguards" for installations in outdoor applications

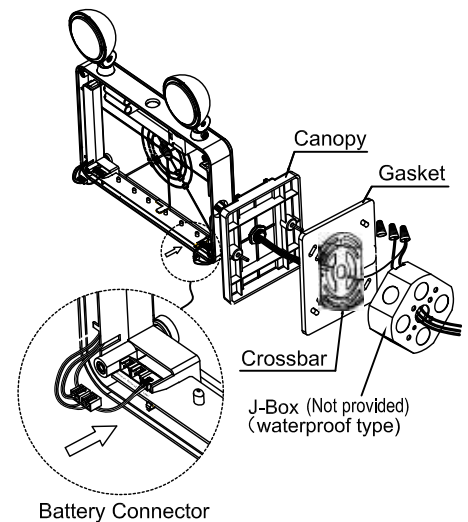


Fig 3

Ceiling suspend mount: See "Important Safeguards" for installations in outdoor applications

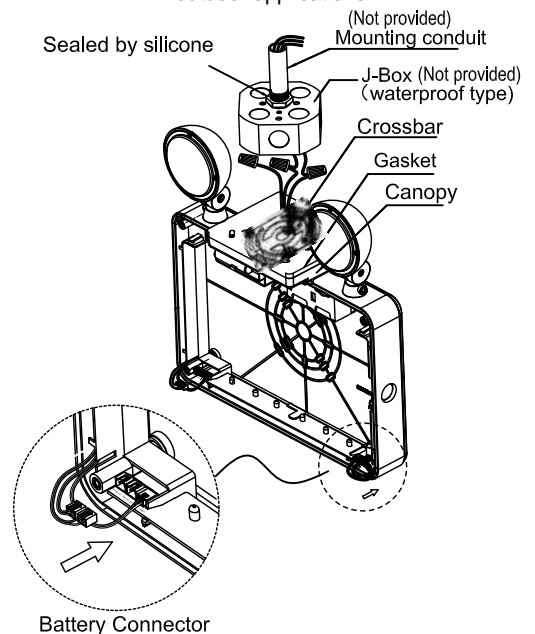
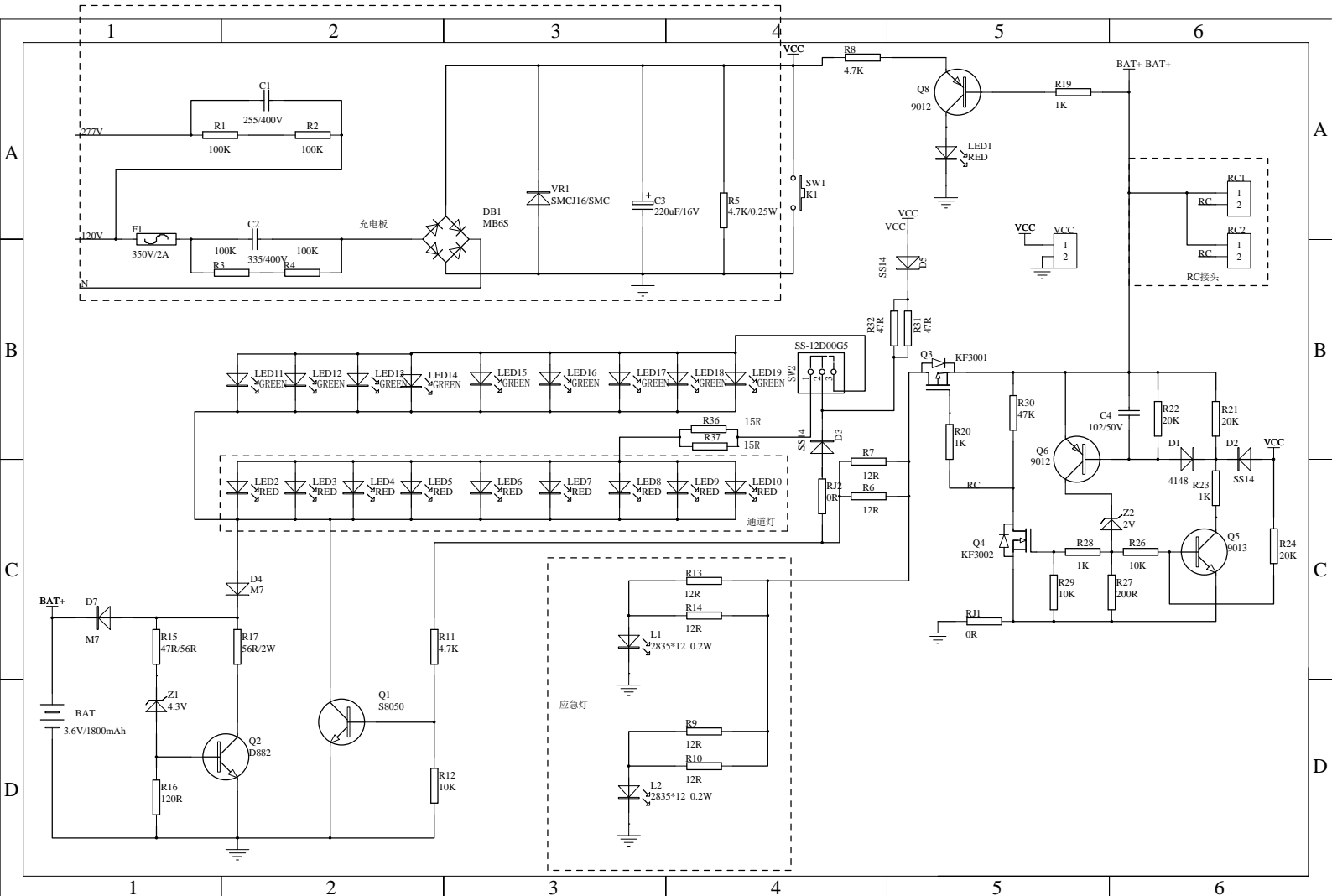
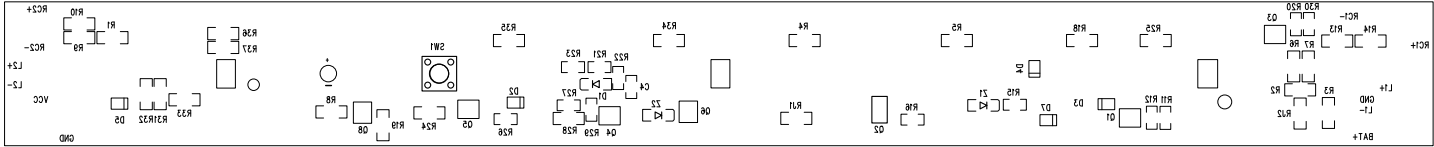
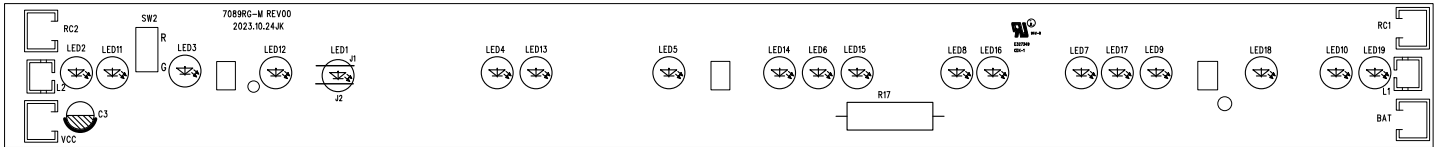


Fig 4

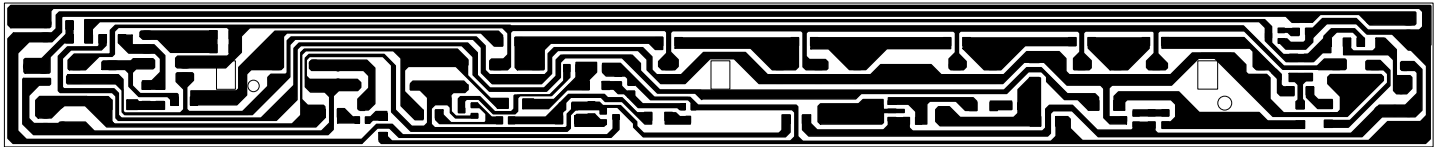
The following Page(s) are related to Illustration-29. The next supplement, if applicable, will be identified with a new Supplement Page Heading.



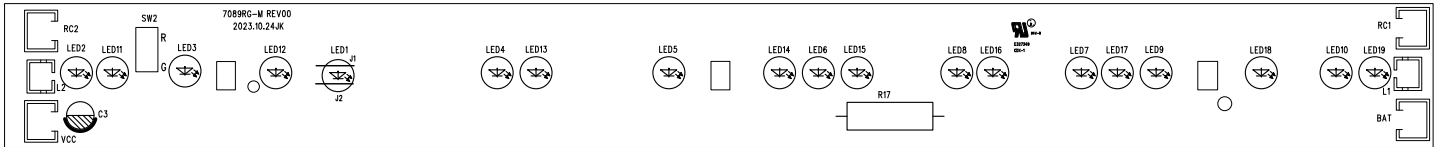




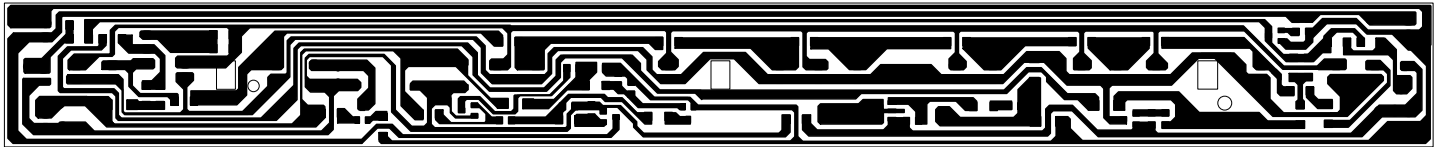
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The following Page(s) are related to Illustration-30. The next supplement, if applicable, will be identified with a new Supplement Page Heading.



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The following Page(s) are related to Illustration-31. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

INSTALLATION INSTRUCTIONS FOR EMERGENCY LIGHTING

Package Contents

Part	Description	Quantity
1	Emergency Lighting	1
2	Hardware Kit	1



Warnings and Cautions

IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. Review the diagrams thoroughly before beginning.
2. All electrical connections must be in accordance with local codes, ordinances and the National Electric code.
3. Disconnect power at fuse or circuit breaker before installing or servicing.
4. Do not use outdoors.
5. Do not mount in hazardous locations, or near gas or electric heaters.
6. Do not let power cords touch hot surface.
7. Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
8. The use of accessory equipment not recommend by the manufacturer may cause an unsafe condition.
9. Do not use this equipment for other than intended use.
10. All servicing should be performed by qualified personnel only.
11. Allow battery to charge for 24 hours before first use.

SAVE THESE INSTRUCTIONS

Mounting Instructions

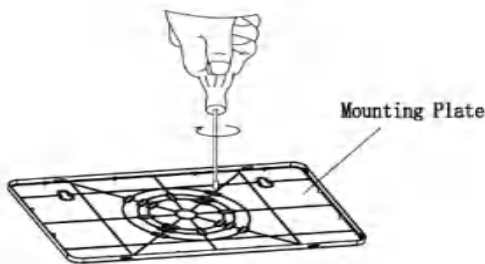
NOTE: First turn off electricity.

Wall mounting (Max. mounting height: 14.2 ft (4.3 m))

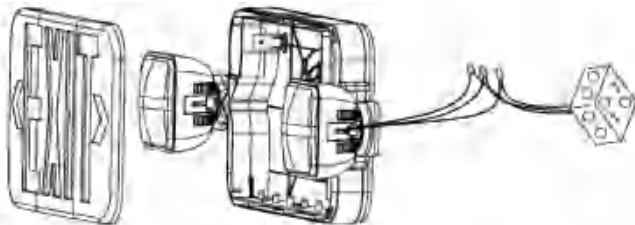
1. Remove mounting plate from fixture.



2. Knockout in back of mounting plate and push wires through the hole.



3. Securely attach mounting plate to J-box (not provided).



4. ELECTRICAL CONNECTIONS

If using 120VAC, connect the black and White wires to the building utility.

If using 277VAC, connect the Orange and White wires to the building utility.

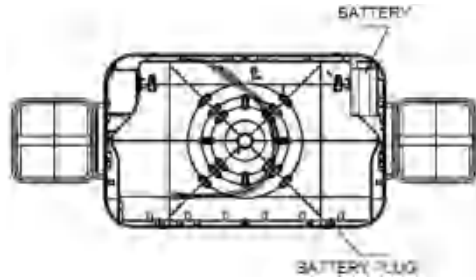


Black
120VAC
INPUT

White
Neutral

Orange
277VAC
INPUT

5. Connect the battery to connector on the PCBA.



6. Snap fixture onto mounting plate and ensure no wires are pinched. Make sure unit is fully attached.

7. Restore power and press test button. Battery powered LED will come on, AC light will turn off.

Ceiling Mounting

1. Open top cover and knockout on the top of fixture.

2. Secure the mounting plate to tube with nut.

3. Push the wires through hole for ceiling mounting.

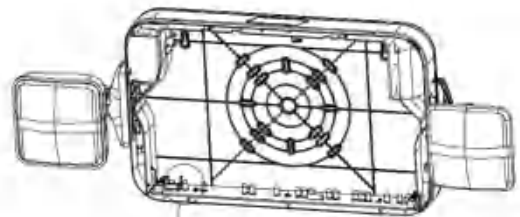


4. Reference step 4-7 in wall mounting above for ceiling mounting.

Notice: Red and Green Exit Light switchable

1. Initial packing is Red LED Exit

2. Switch to Green LED Exit if necessary



Push to R for Red Exit

Push to G for Green Exit



OPTION: Remote head capable

Support 3.6V 5W (Do not overload)

The following Page(s) are related to Illustration-32. The next supplement, if applicable, will be identified with a new Supplement Page Heading.

INSTALLATION INSTRUCTIONS FOR EMERGENCY LIGHTING

Package Contents

Part	Description	Quantity
1	Emergency Lighting	1
2	Hardware Kit	1



Warnings and Cautions

IMPORTANT SAFEGUARDS

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

1. Review the diagrams thoroughly before beginning.
2. All electrical connections must be in accordance with local codes, ordinances and the National Electric code.
3. Disconnect power at fuse or circuit breaker before installing or servicing.
4. Do not use outdoors.
5. Do not mount in hazardous locations, or near gas or electric heaters.
6. Do not let power cords touch hot surface.
7. Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
8. The use of accessory equipment not recommend by the manufacturer may cause an unsafe condition.
9. Do not use this equipment for other than intended use.
10. All servicing should be performed by qualified personnel only.
11. Allow battery to charge for 24 hours before first use.

SAVE THESE INSTRUCTIONS

Mounting Instructions

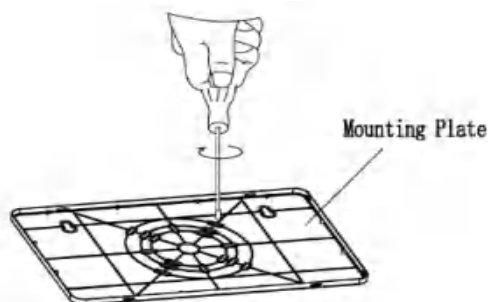
NOTE: First turn off electricity.

Wall mounting (Max. mounting height: 7.2 ft (2.2 m))

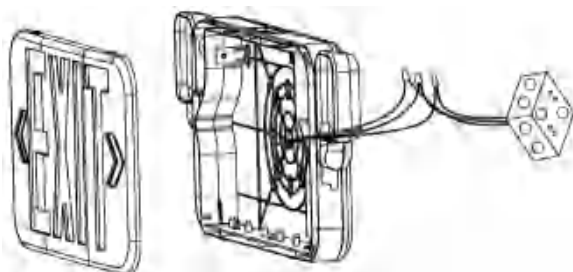
1. Remove mounting plate from fixture.



2. Knockout in back of mounting plate and push wires through the hole.



3. Securely attach mounting plate to J-box (not provided).



4. ELECTRICAL CONNECTIONS

Make the proper supply wire connections.

If using 120VAC, connect the black and White wires to the building utility.

If using 277VAC, connect the Orange and White wires to the building utility.

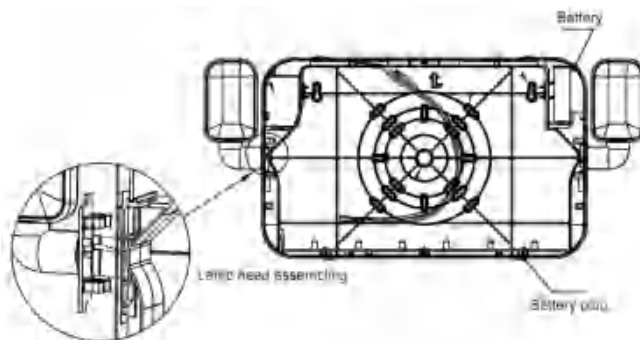


Black
120VAC
INPUT

White
Neutral

Orange
277VAC
INPUT

5. Connect the battery to connector on the PCBA.



6. Snap fixture onto mounting plate and ensure no wires are pinched. Make sure unit is fully attached.

7. Restore power and press test button. Battery powered LED will come on, AC light will turn off.

Ceiling Mounting

1. Open top cover and knockout on the top of fixture.

2. Secure the mounting plate to tube with nut.

3. Push the wires through hole for ceiling mounting.

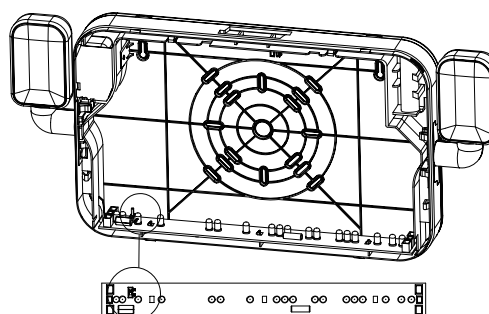


4. Reference step 4-7 in wall mounting above for ceiling mounting.

Notice: Red and Green Exit Light switchable

1. Initial packing is Red LED Exit

2. Switch to Green LED Exit if necessary



 Push to R for Red Exit

 Push to G for Green Exit