1.0 Reference and Address			
Report Number	24090141HKG-001	Original Issued: 20-May-2025	Revised: None
Standard(s)	Motor-operated Air Compressors, Vacuum Pumps, and Painting Equipment [UL 1450:2010 Ed.4+R:27May2021] Motor-Operated Appliances (Household and Commercial) (R2023) [CSA C22.2#68:2018 Ed.8+U1]		

Applicant	The NOCO Company	Manufacturer 1	
Address	30339 Diamond Parkway #102 GLENWILLOW OH 44139-5400	Address	
Country	USA	Country	
Contact	Jonathan Nook	Contact	
Phone	+1-216-464-8131	Phone	
FAX	+1-216-464-8172	FAX	
Email	jonathan.nook@noco-usa.com	Email	

2.0 Product Description	
Product	Air Compressor
Brand name	NOCO
Description	The product covered by this report is a portable Air Pump. For temporary outdoor use only. The product has single input/output USB-C port, one air outlet hose, and LED light. The product contains with three non-detachable rechargeable lithium-ion cells in seriers (1P3S).
Models	AL5
Model Similarity	NA
Ratings	Air Pump: 11.1VDC, 10A USB-C PD IN : 5VDC/3A, 9VDC/3A, 12VDC/2.5A, 15VDC/2A, 20VDC/1.5A USB-C PD OUT : 5VDC/3A, 9VDC/3A, 12VDC/2.5A, 15VDC/2A, 20VDC/1.5A
Other Ratings	NA

3.0 Product Photographs

Photo 1 - Overall view of Air Pump, model AL5

Photo 2 - Overall view of Air Pump, model AL5

3.0 Product Photographs

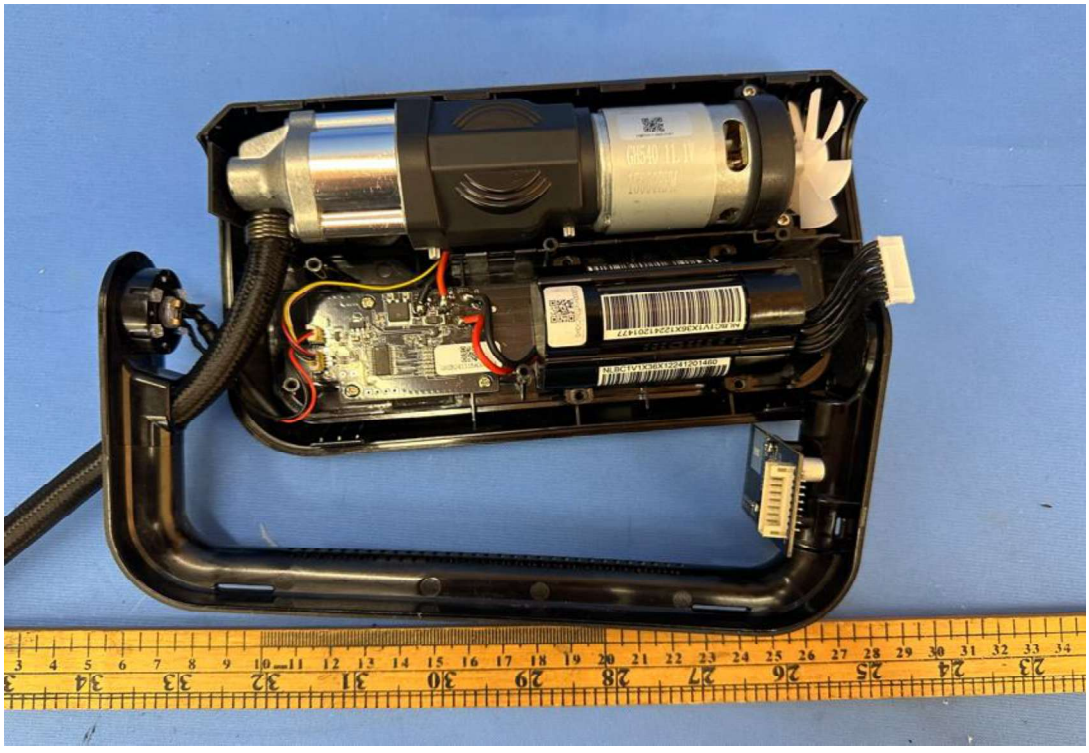
Photo 3 - Overall view of Air Pump, model AL5

Photo 4 - Overall view of Air Pump, model AL5

3.0 Product Photographs

Photo 5 - Internal view of Air Pump, model AL5

Photo 6 - Internal view of Air Pump, model AL5



3.0 Product Photographs

Photo 7 - Internal view of Air Pump, model AL5

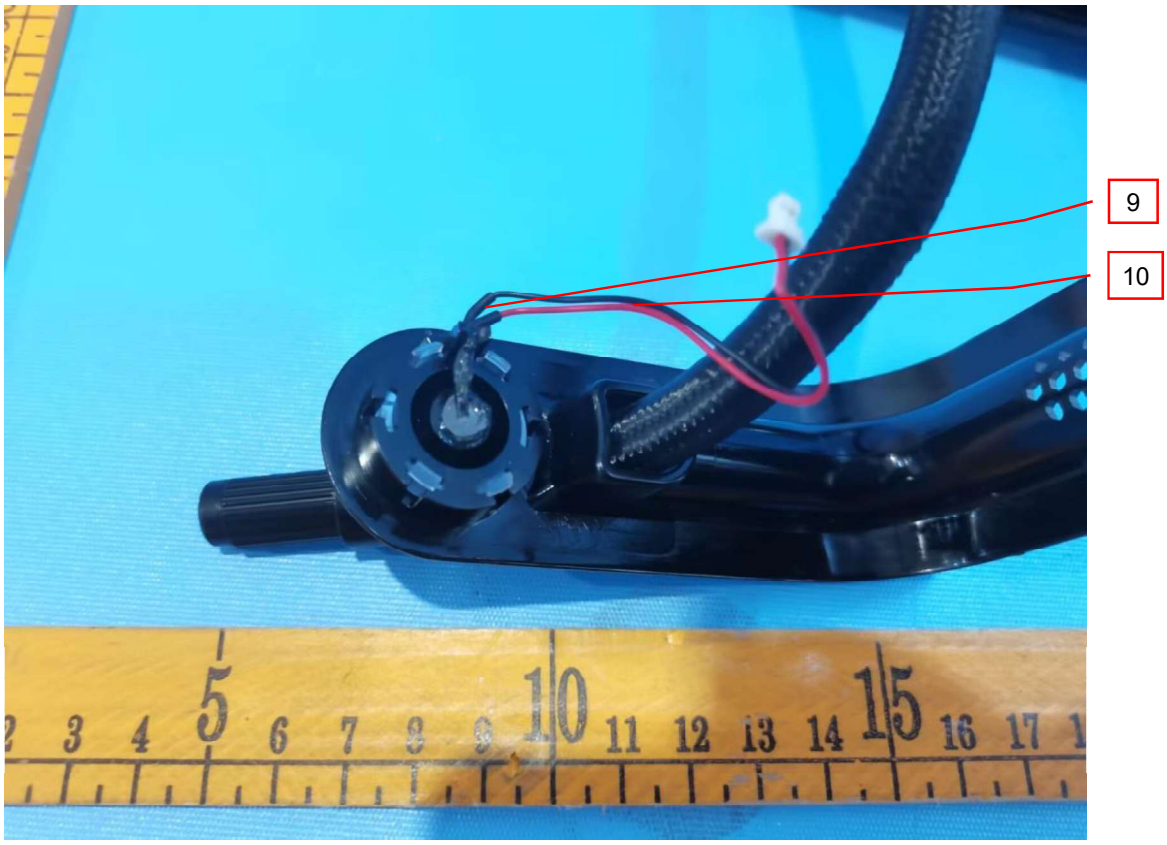
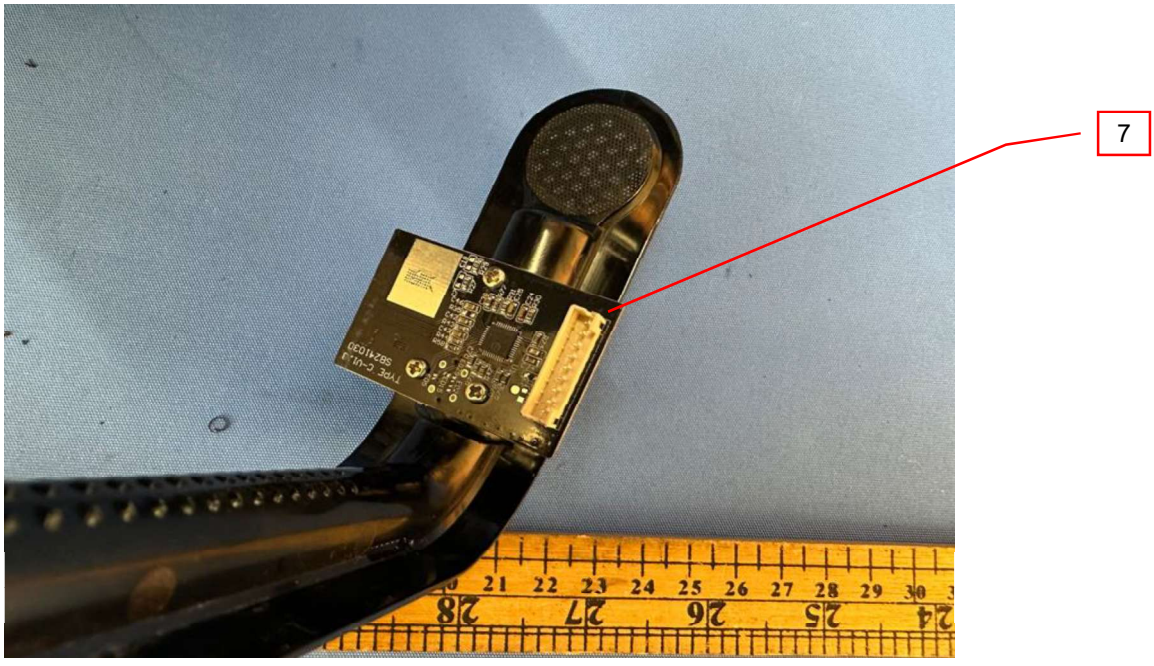


Photo 8 - Internal view of Air Pump, model AL5



3.0 Product Photographs

Photo 9 - Internal view of Air Pump, model AL5

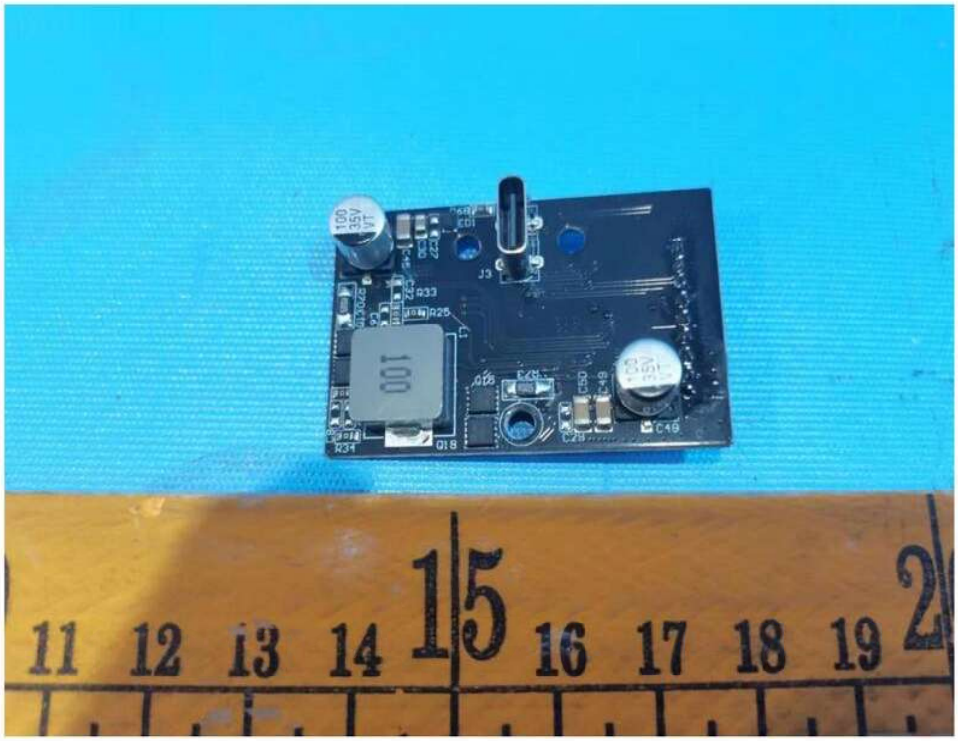
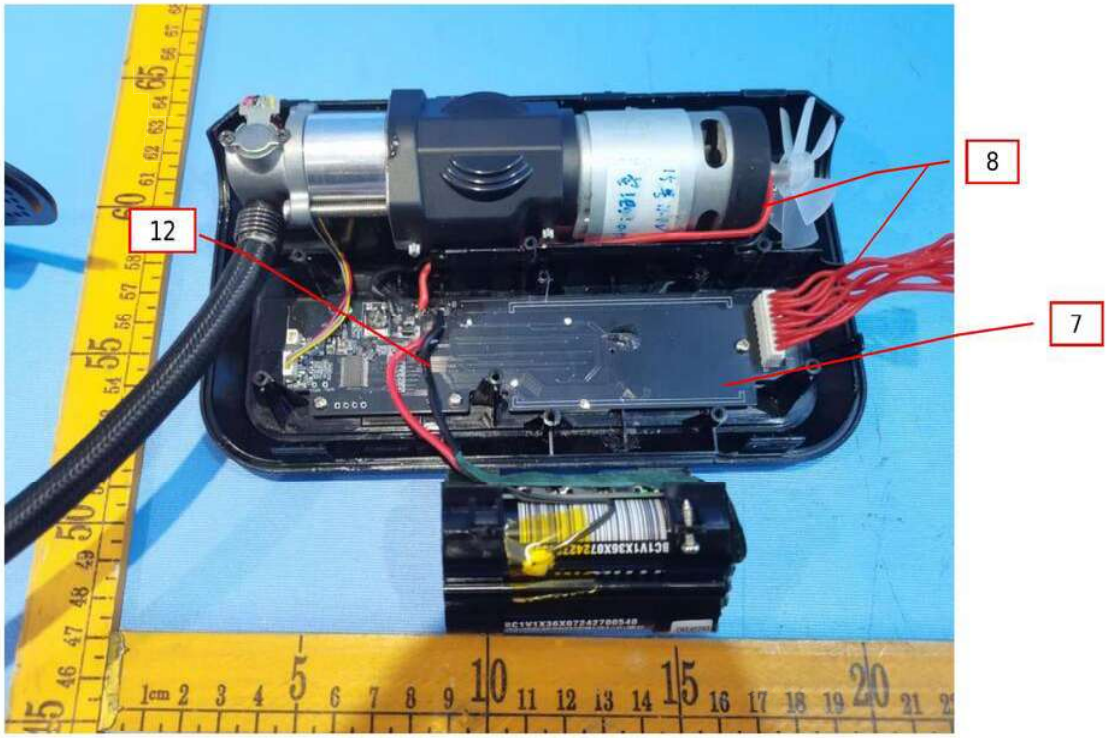


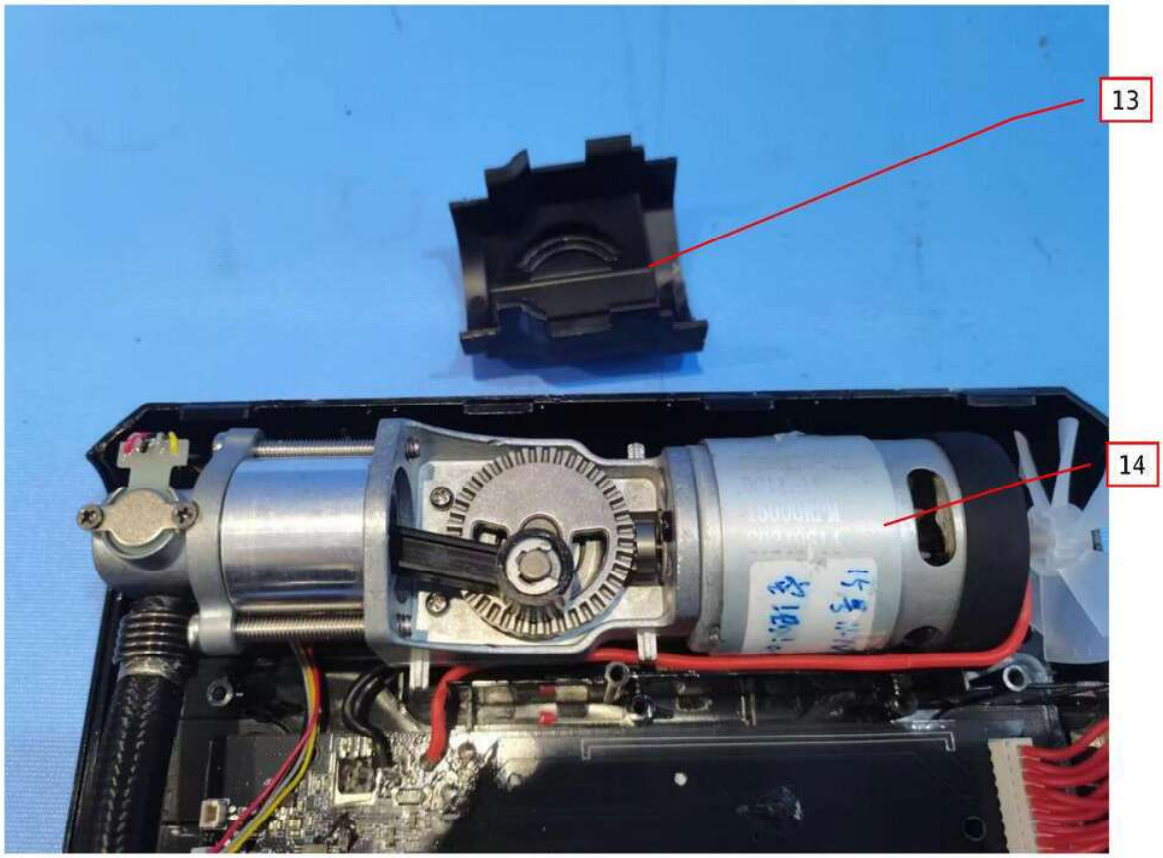
Photo 10 - Internal view of Air Pump, model AL5



3.0 Product Photographs

Photo 11 - Internal view of Air Pump, model AL5

Photo 12 - Internal view of Air Pump, model AL5



3.0 Product Photographs

Photo 13 - Internal view of Air Pump, model AL5

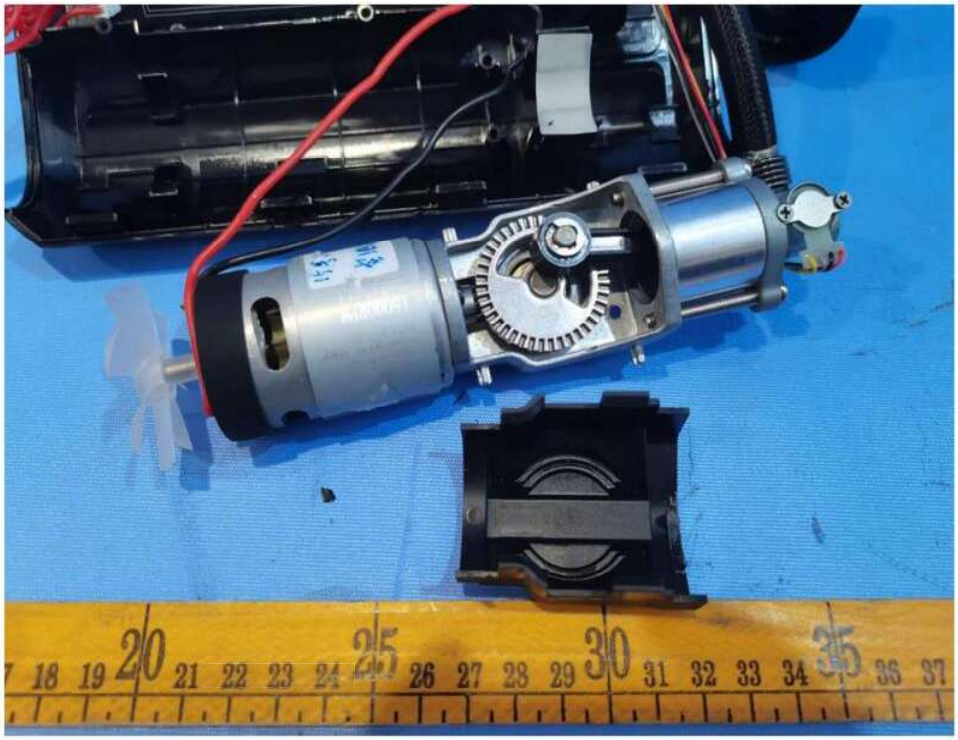
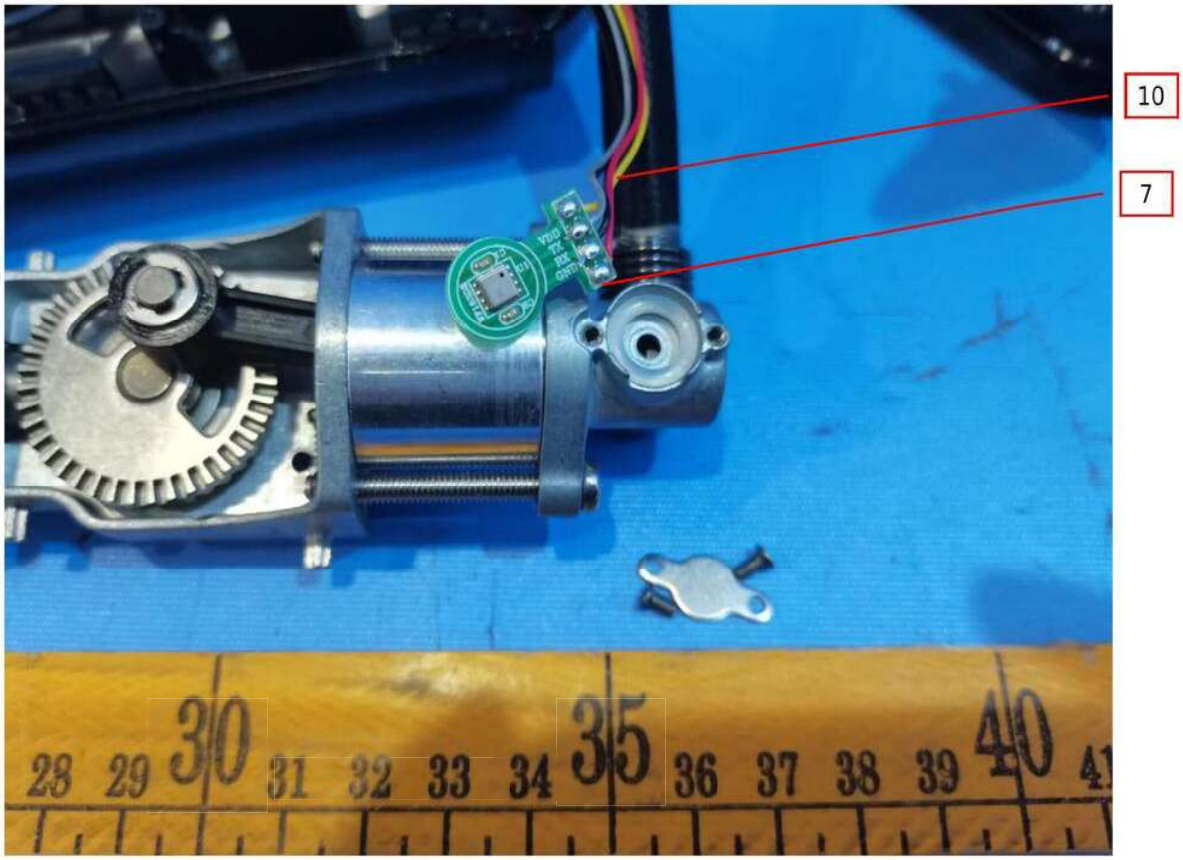


Photo 14 - Internal view of Air Pump, model AL5



3.0 Product Photographs

Photo 15 - Battery Pack view of Air Pump, model AL5

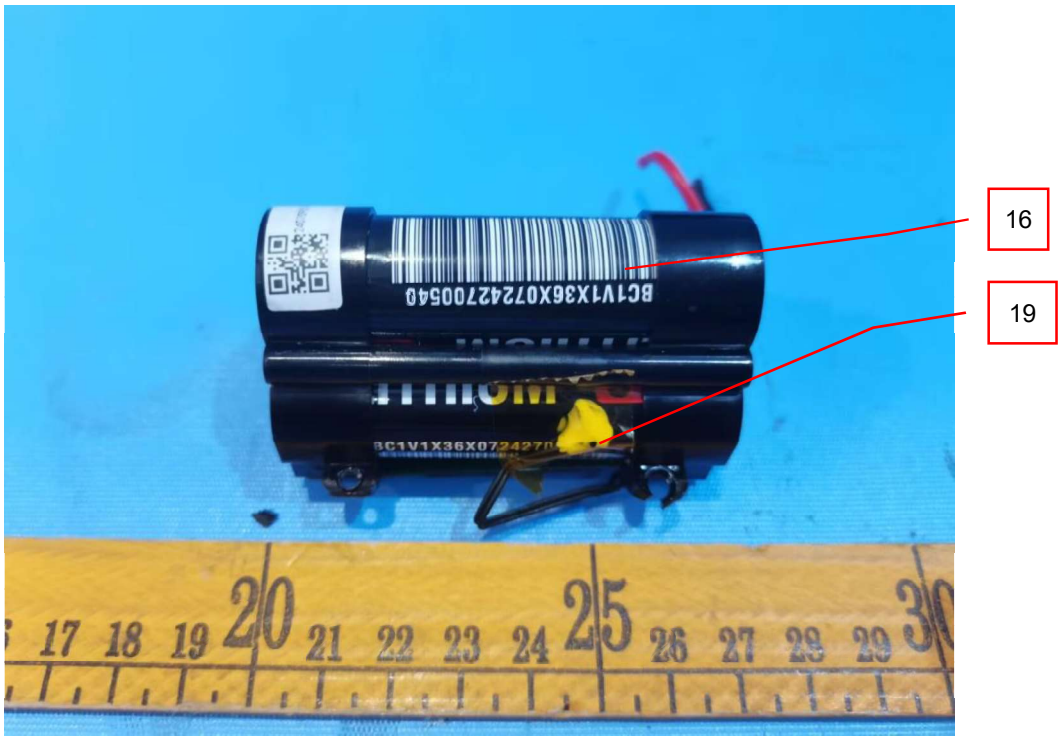
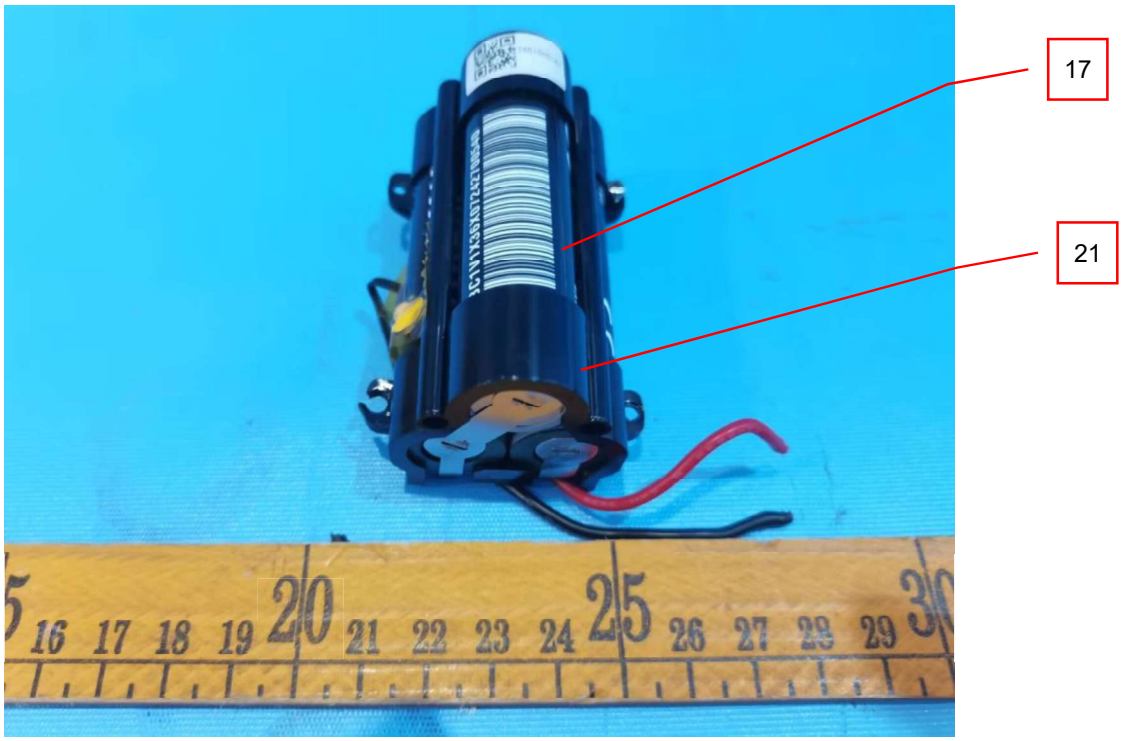


Photo 16 - Battery Pack view of Air Pump, model AL5



3.0 Product Photographs

Photo 17 - Battery Pack view of Air Pump, model AL5

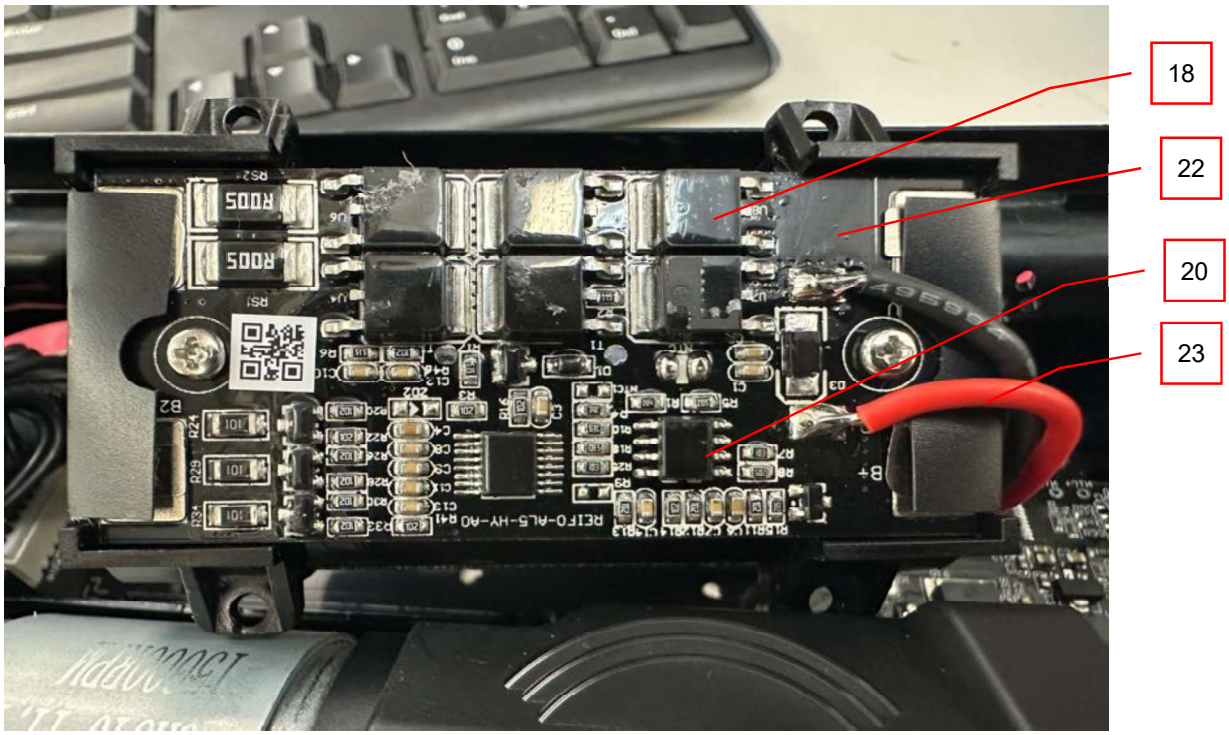


Photo 18 - Motor view of Air Pump, model AL5

4.0 Critical Components						
Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity [3]
1	1	Front Housing			Rated 94V-0, HWI=3, HAI=3, 120°C, 3.0mm thick minimum.	cURus
					Rated 94V-0, HWI=0, HAI=0, 105°C, 3.0mm thick minimum.	cURus
2	2	Rear Housing			Rated 94V-0, HWI=3, HAI=3, 120°C, 3.0mm thick minimum.	cURus
					Rated 94V-0, HWI=0, HAI=0, 105°C, 3.0mm thick minimum.	cURus
4	3	Middle Cover			Rated 94V-0, HWI=3, HAI=3, 120°C, 3.0mm thick minimum.	cURus
					Rated 94V-0, HWI=0, HAI=0, 105°C, 3.0mm thick minimum.	cURus
3	4	Lamp Cover			Rated 94V-2, HWI=3, HAI=3, 120°C, 1.5mm thick minimum.	cURus
1	5	Control Panel			Rated 94V-0, 80°C, 0.25mm thick minimum.	cURus
1	6	Key Pad			Rated 94V-0.	cURus
8,10, 14	7	Main PCB, USB PCB, Sensor PCB			Double sided. Rated 94V-0, 130°C minimum, meets UL796DSR. 1.6mm thick.	cURus
10	8	Internal Wire			#18-24AWG, rated 300V, 150°C minimum.	cURus
7	9	Heat Shrinkable Tube			Rated 600V, 125°C, VW-1.	cURus

4.0 Critical Components						
Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity [3]
7, 14	10	Internal lead wire			#24-28AWG, rated 30V, 80°C minimum. Connected Sensor PCB and Main PCB, Connected LED and Main PCB,	cURus
3	11	LED			White color, V =3.0-3.3V, If = 150mA. (1 provided)	NR
10	12	Triac (Q16)			Rated 30V, 90A	NR
12	13	Gear Cover			Rated 94V-2, HWI=3, HAI=3, 120°C, 1.5mm thick minimum.	cURus
12	14	Motor			Rated 12VDC. No-load speed: 15000rpm ± 10%, No-load current: 1.0A max. Consists of following items:	NR
22	14a	Lead Wire			#18AWG, rated 3000Vdc, 150°C minimum.	cURus
23	14b	Rotor Magnet wire			Rated 180 ºC minimum. 1mm diameter, 10.5 turns	UR
13-16	14c	Slot wedge (Not Shown)			HB; 65ºC	UR
23	14d	Carbon brush bracket			Rated 94V-0, HWI=0, HAI=2, 150°C, 0.8mm thick minimum.	cURus
22	14e	Inductor			Rated 1.6uH (2 provided)	NR
22	14f	Inductor winding wire			180 ºC; 1.0mm dia x 10.5 turns	cURus
22	14g	Fan blade			Rated 94V-0, 65°C minimuim.	cURus
1	15	Label (Not Shown)			Rated min. 80°C, pressure-sensitive printed labels, suitable for PC surface Use. Adhered to Rear Housing (Item 4).	UR
15-17	16	Battery Pack			11.1VDC, 2000mAh, 22.2Wh.	NR
16	17	Battery Cell			Lithium battery; 3.7V, 2000mAh. Upper Limit Charging Voltage (Vdc): 4.2V Max Charging Current (mA): 2.0A	UR
17	18	MOSFET (Q1, Q2, Q3, Q4, Q5, Q6)			30V, 80A	NR

4.0 Critical Components

Photo #	Item no.[1]	Name	Manufacturer/ trademark[2]	Type / model[2]	Technical data and securement means	Mark(s) of conformity [3]
15	19	NTC			Resistance at 25°C: 100Kohm± 1%, Tmoa: 200°C. B value: 3435K	NR
17	20	Control IC			Overcharge detection voltage:4.25±0.05V; Overdischarge detection voltage: 2.70V±0.1V;	NR
16	21	Battery Cell Bracket			Rated 94V-0, PC, HWI=0, HAI=0, 105°C, min. thickness 3.0mm.	cURus
17	22	PCB			Min. thickness 1.0mm V-0, 130°C	UR
17	23	Lead wire			Min. 18AWG, min. 200°C, 3000Vdc	UR

NOTES:

1) Not all item numbers are indicated (called out) in the photos, as their location is obvious.

2) "Various" means any type, from any manufacturer that complies with the "Technical data and securement means" and meets the "Mark(s) of conformity" can be used.

3) Indicates specific marks to be verified, which assures the agreed level of surveillance for the component. "NR" - indicates Unlisted and only visual examination is necessary. "See 5.0" indicates Unlisted components or assemblies to be evaluated periodically refer to section 5.0 for details.

5.0 Critical Unlisted CEC Components

No Unlisted CEC components are used in this report.

6.0 Critical Features

Recognized Component - A component part, which has been previously evaluated by an accredited certification body with restrictions and must be evaluated as part of the basic product considering the restrictions as specified by the Conditions of Acceptability.

Listed Component - A component part, which has been previously Listed or Certified by an accredited Certification Organization with no restrictions and is used in the intended application within its ratings.

Unlisted Component - A part that has not been previously evaluated to the appropriate designated component standard. It may also be a Listed or Recognized component that is being used outside of its evaluated Listing or component recognition.

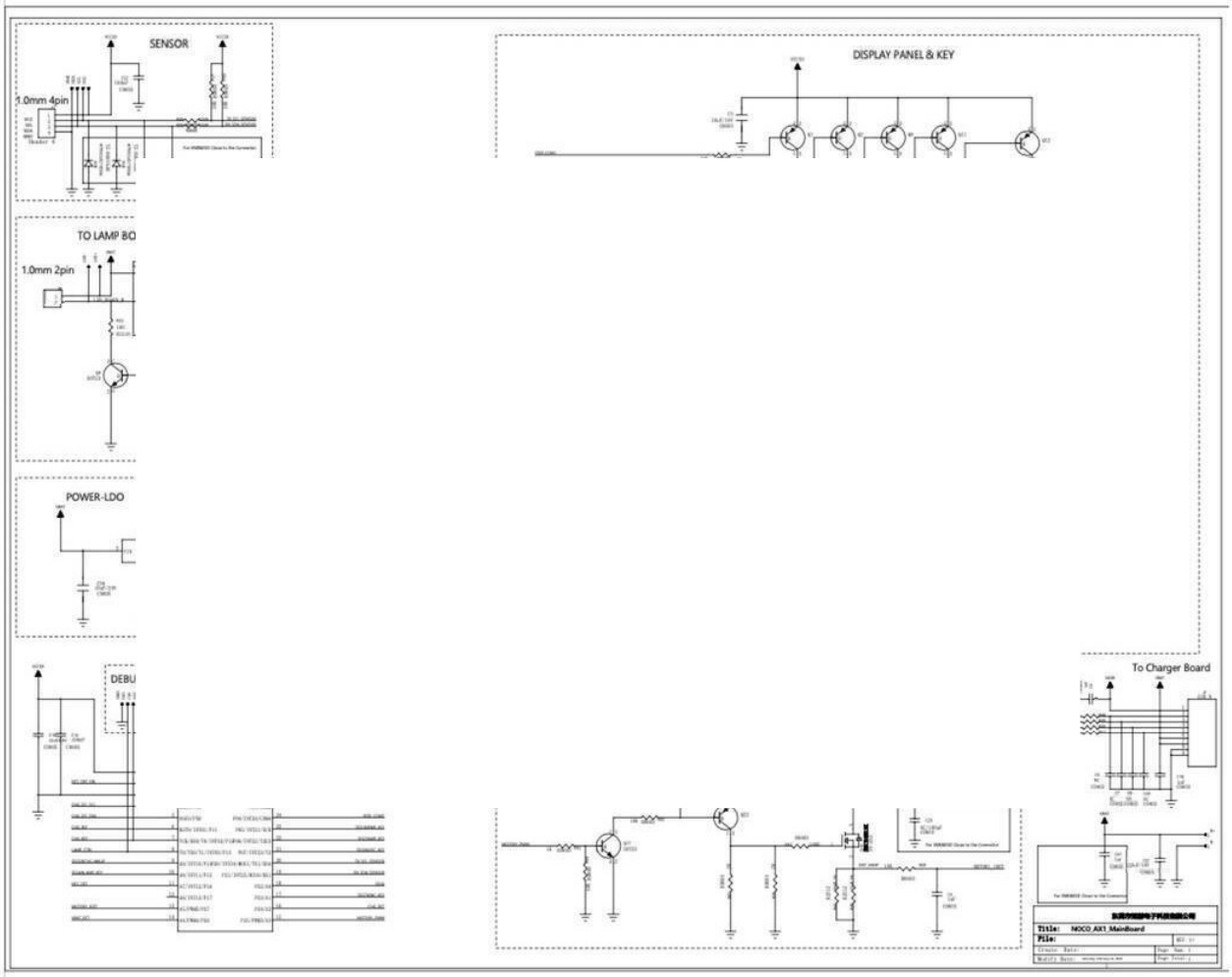
Critical Features/Components - An essential part, material, subassembly, system, software, or accessory of a product that has a direct bearing on the product's conformance to applicable requirements of the product standard.

Construction Details - For specific construction details, reference should be made to the photographs and descriptions. All dimensions are approximate unless specified as exact or within a tolerance. In addition to the specific construction details described in this Report, the following general requirements also apply.

1. Spacing - As the appliance is supplied by listed Adapter, no spacing requirement is considered.
2. Mechanical Assembly - Components such as switches, fuseholders, connectors, wiring terminals and display lamps are mounted and prevented from shifting or rotating by the use of lockwashers, starwashers, or other mounting format that prevents turning of the component.
3. Corrosion Protection - All ferrous metal parts are protected against corrosion by painting, plating or the equivalent.
4. Accessibility of Live Parts - All uninsulated live parts in primary circuitry are housed within a metal or non-metallic enclosure constructed with no openings other than those specifically described in Sections 4 and 5.
5. Grounding - This product is not provided with a means of grounding as it is not required to be grounded.
6. Internal Wiring - Internal wiring is routed away from sharp or moving parts. Internal wiring leads terminating in soldered connections are made mechanically secure prior to soldering. Recognized Component separable (quick disconnect) connectors of the positive detent type, closed loop connectors, or other types specifically described in the text of this report are also acceptable as internal wiring terminals. At points where internal wiring passes through metal walls or partitions, the wiring insulation is protected against abrasion or damage by plastic bushings or grommets.
7. Schematics - Refer to Illustration No. 1, 1a, 1b, and 2, 2a for schematics requiring verification during Field Representative Inspection Audits.
8. Markings - The product is marked on the Rear Housing by labelling system as described in item 15 of Section 4.0 as follows:
   - applicant's name or brand name
   - model number
   - electrical ratings
   - date code system
9. Cautionary Markings - The following are required: Lettering shall not be less than 2.4mm high. Lettering shall not be less than 2.0mm high (Refer to item 15 of Section 4.0).
10. Installation, Operating and Safety Instructions - Instructions for installation and use of this product are provided by the manufacturer. "IMPORTANT SAFEGUARDS", "MISES EN GARDE SÉCURITAIRES IMPORTANTES", "SAVE THESE INSTRUCTIONS" and "SAUVEGARDER CES INSTRUCTIONS" shall be emphasized and in letter not less than 4.8mm high.

7.0 Illustrations

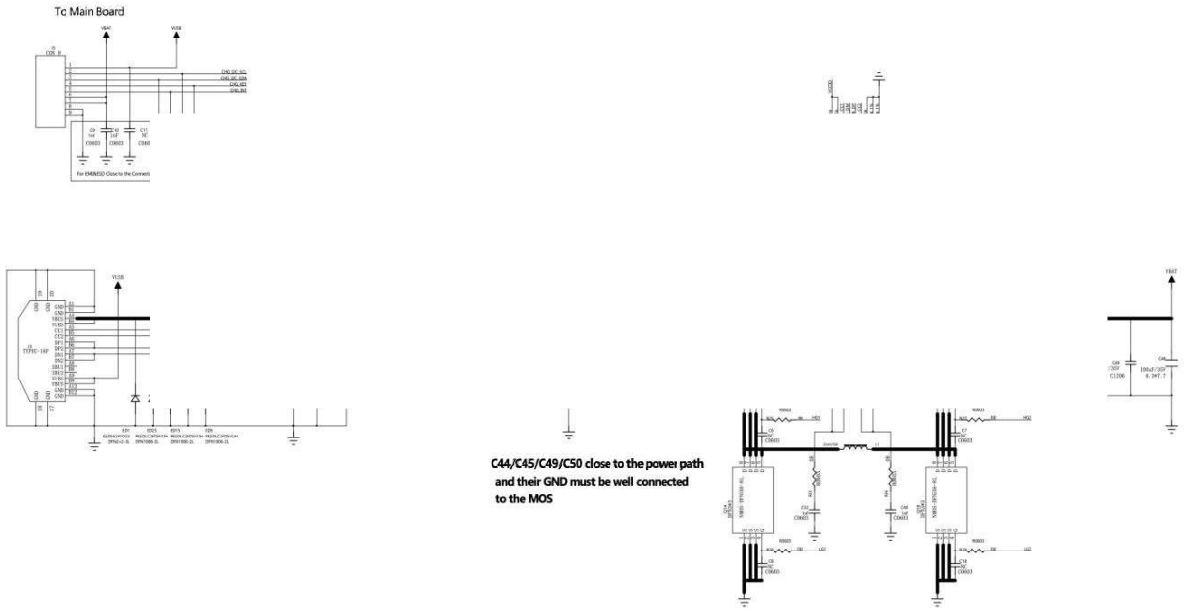
Illustration 1 - Circuit Diagram



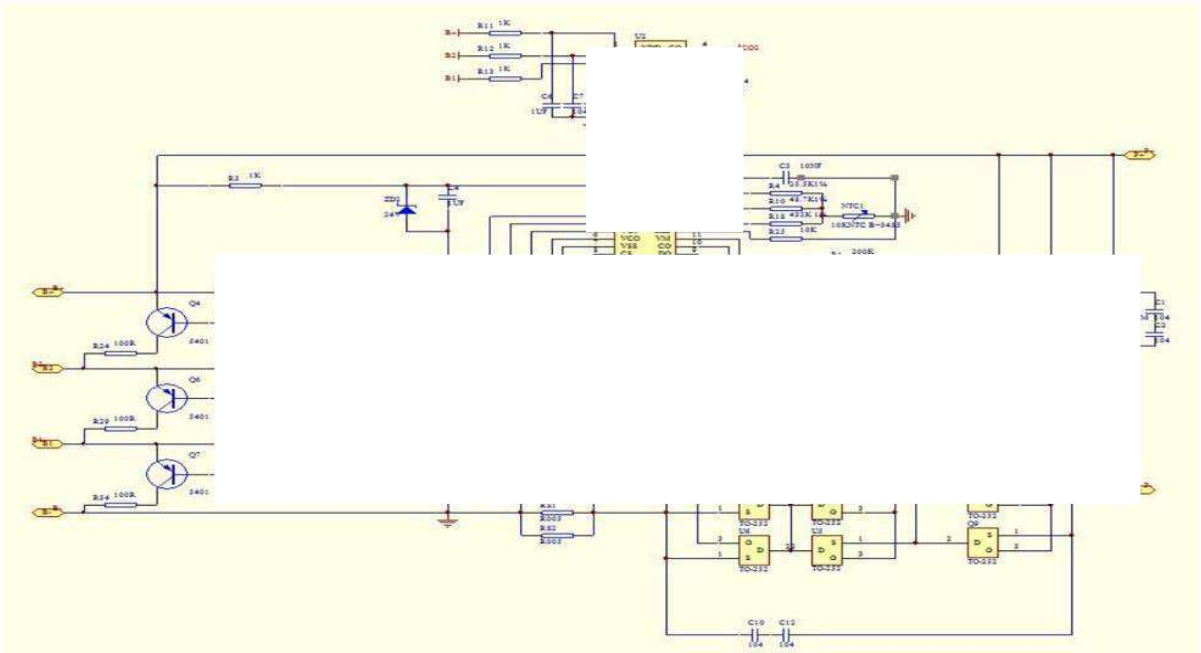
For main PCB

7.0 Illustrations

Illustration 1a - Circuit Diagram



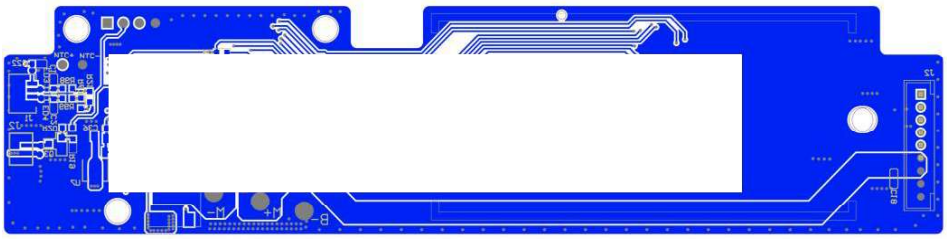
For charge PCB



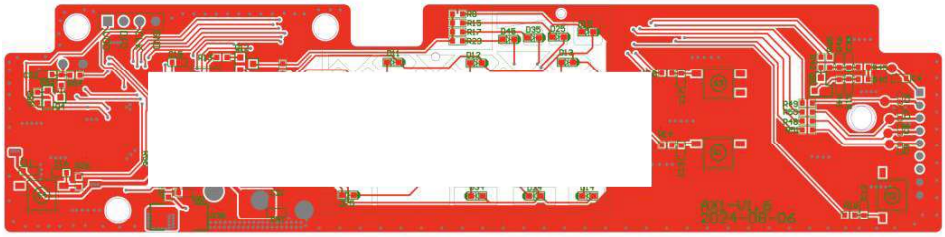
For Battery Pack

7.0 Illustrations

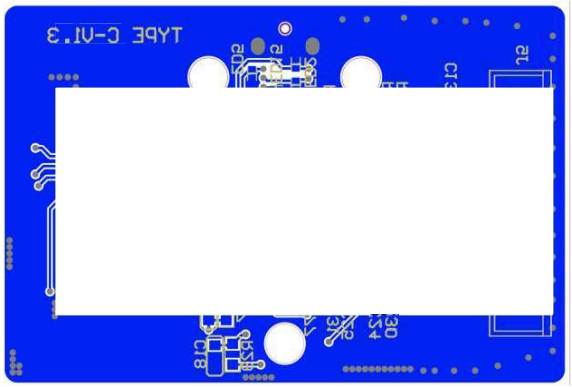
Illustration 2 - PCB layout



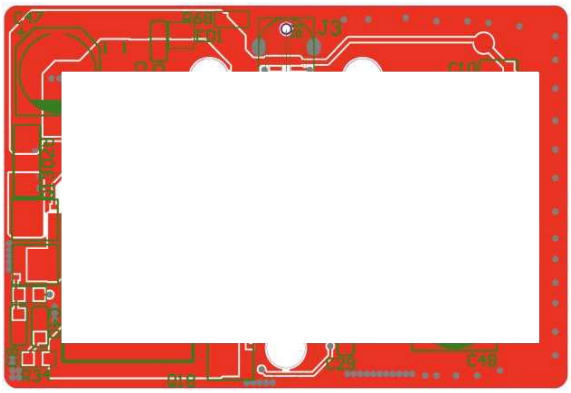
For Main PCB, Top side



For Main PCB, Bottom side



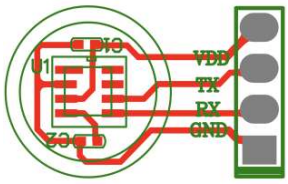
For charge PCB, Top side



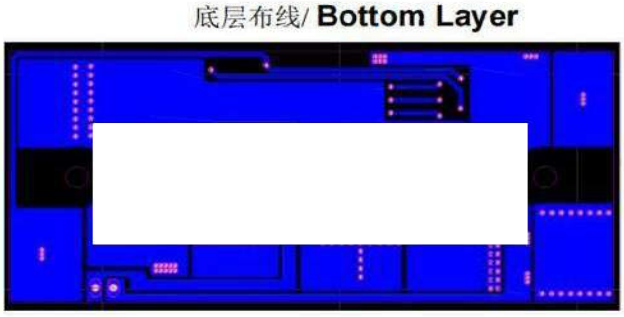
For charge PCB, Bottom side

7.0 Illustrations

Illustration 2a - PCB layout



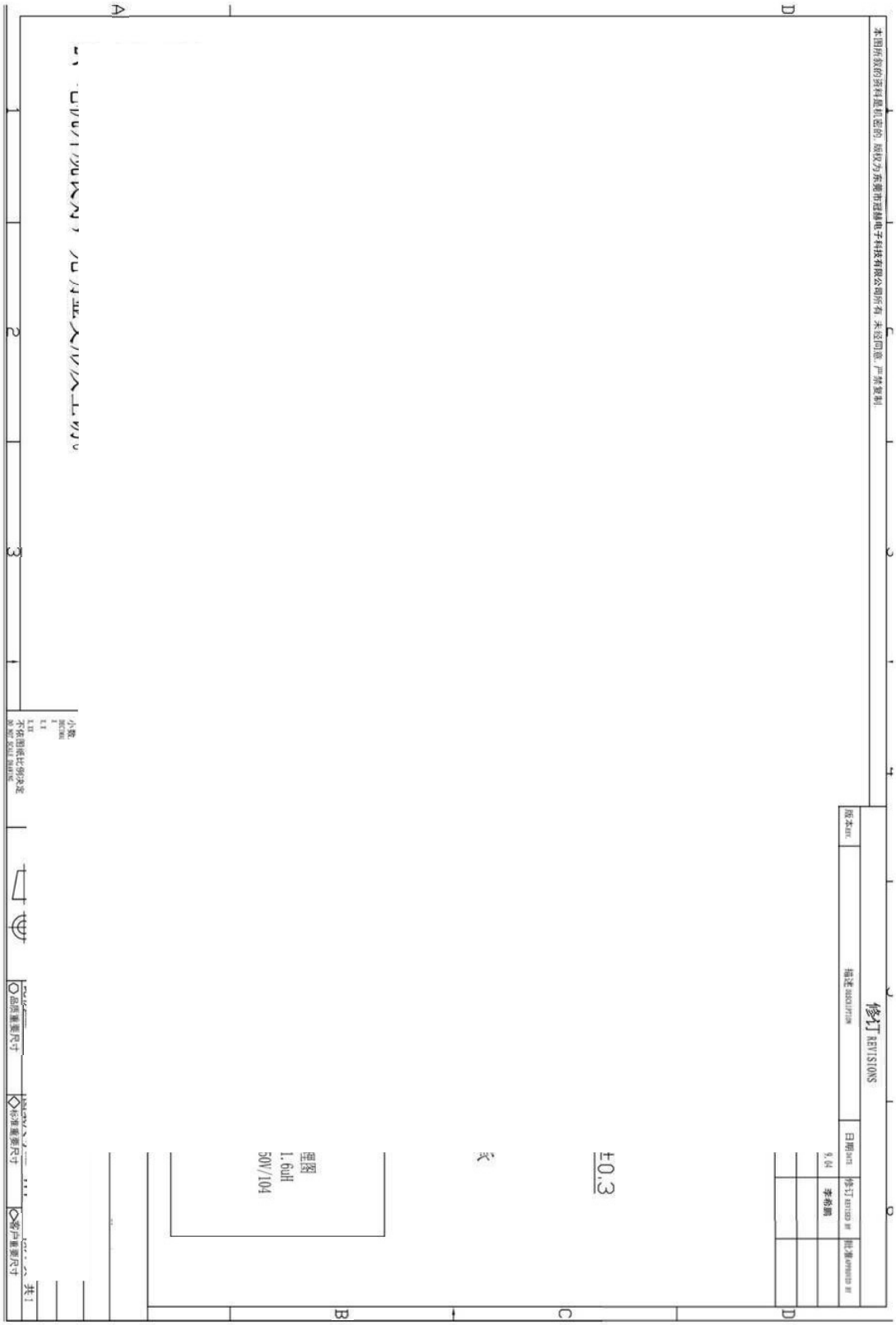
For sensor PCB



For Battery Pack

7.0 Illustrations

Illustration 3 - Drawing of Motor



7.0 Illustrations

Illustration 4 - Specification of Battery Pack

3 Electrical characteristics 电气特性 Topt=25℃

Item 项目	Symbol 符号	Content 详细内容	Criterion 标准	
电池保护电路部分				
Over charge Protection 过充保护（单节一次保护）	V_{DET1}	Over charge detection voltage 过充电检测电压	4.225±0.025V	
	tV_{DET1}	Over charge detection delay time 过充电检测延迟时间	700-1300mS	
	V_{REL1}	Over charge release voltage 过充电解除电压	4.025±0.05V	
Over charge Protection 过充保护（单节二次保护）	V_{DET1}	Over charge detection voltage 过充电检测电压	4.25±0.025V	
	tV_{DET1}	Over charge detection delay time 过充电检测延迟时间	700-1300mS	
	V_{REL1}	Over charge release voltage 过充电解除电压	4.15±0.05V	
Over discharge protection 过放保护（单节）	V_{DET2}	Over discharge detection voltage 过放电检测电压	2.7±0.05V	
	tV_{DET2}	Over discharge detection delay time 过放电检测延迟时间	500-1500mS	
	V_{REL2}	Over discharge release voltage 过放电解除电压	3.0±0.05V	
		Over discharge Release condition 过放恢复条件	V_{REL2}>Batt	
Over current protection 过流保护	V_{DET3}	Discharge Over current detection voltage 放电过电流检测电压	0.05±0.005V	
	I_{DP}	Discharge Over current detection current 放电过流保护电流	10±3.0A	
	tV_{DET3}	Discharge Detection delay time 放电过流延迟时间	500-1500mS	
		Release condition 保护解除条件	Cut load/charge 断开负载/充电激活	
Short protection 短路保护	VSHORT	Short Detection condition 短路保护条件	Exterior short circuit 外部电路短路	
	T_{SHORT}	Short Detection delay time 短路检测延迟时间	100-600US	
	NSHORT	Short Release condition 短路保护解除条件	Cut short circuit 断开短路电路	
Interior resistance 内阻	R_{SS}	Main loop electrify resistance 主回路通态电阻	R_{ss}≤60mΩ	
Current consumption 消耗电流	I_{DD}	Current consume in normal operation 电路内部消耗	≤50uA	
总电压管理部分				
充电温度保护		充电温度保护	50±5℃	
		低温充电温度保护	-10±5℃	
放电温度保护		放电高温保护	70±5℃	
		放电低温保护	-25±5℃	
充电电流	Io	最大充电工作电流	≤3.0A	
均衡电压		均衡启动电流（均衡方式：耗能式）	4.125±0.05V	
均衡电流	IAT	均衡启动电流（均衡方式：耗能式）	≤100mA	
放电电路部分				
最大工作电流	IA	最大放电工作电流	≤3.0A	
短路电流	IBT	最大放电短路保护电流（MOS 所能承受的冲击电流瞬间≤300US	/	
外部控制	/			
保护板工作温度范围		标准 25 度参考标准	-25℃ +80℃	
PCM 尺寸		64.6*29.6*1.0	±0.2mm	
保护板尺寸		64.6*29.6*3.2	±0.2mm	

8.0 Test Summary					
Evaluation Period	11-Aug-2024 to 19-Aug-2024			Project No.	HK2409141
Sample Rec. Date	1-Aug-2024	Condition	Prototype	Sample ID.	#1- #4
Test Location	Intertek Testing Services Hong Kong Ltd. (Address: 2/F., Gament Centre, 576 Castle Peak Road, Kowloon, Hong Kong).				
Test Procedure	Testing Lab				

Determination of the result includes consideration of measurement uncertainty from the test equipment and methods. The product was tested as indicated below with results in conformance to the relevant test criteria.

The following tests were performed:

Test Description	UL 1450:2010 Ed.4+R:27May2021 Clause	CSA C22.2#68:2018 Ed.8+U1 Clause	UL 746C:2018 Ed.7+R:01Sep2021 Clause
Surface Temperatures	32	--	--
Stability	33	--	--
Input Test	45	--	--
Temperature Test	46	--	--
Strain Relief Test	52	--	--
Push-Back Strain Relief Test	53	--	--
Abnormal Operation Test	54	--	--
Rating	--	6.4	--
Temperature (Normal)	--	6.5	--
Temperature (Abnormal)	--	6.7	--
Stability	--	6.10	--
Physical Abuse	--	6.11	--
Strain Relief, Flexing, and Cord Set Retention	--	6.12	--
Oven Conditioning (Nonmetallic Enclosures)	--	6.21	--
Strain-Relief Test after Mold Stress-Relief Distortion	--	--	31
Polymeric Enclosure Impact Test	--	--	56
Mold Stress-relief Distortion Test	--	--	61

Test Description	CSA C22.2 No.77-14, rev. Aug 2014 Clause	UL 1004-1:2012 Ed.2+R:07Aug2018 Clause	UL 1004-3:2015 Ed.2 Clause
Dielectric Voltage-Withstand Test	5.5	37	-
Locked Rotor Temperature Test	5.4	-	8

Test Description	-	CSA C22.2 #0.23:2015 Ed.1 Clause
Heating	-	9
Normal Charging of Lithium-ion Systems	-	10
Abnormal Operation - Appliance systems	-	11.1
Abnormal Operation - Electronic circuit fault conditions	-	11.3
Abnormal Operation - Lithium-ion charging systems	-	11.7
Abnormal Operation - Lithium-ion battery short circuit	-	11.8
Vibration for Lithium-Ion Batteries	-	13
Lithium-Ion Enclosure Pressure Test	-	14
Mechanical Strength	-	15
Glow Wire Test	-	21.1
Ball Pressure	-	21.2
Component Testing Reviewer	-	Danny Tang

8.0 Test Summary			
8.1 Signatures			
A representative sample of the product covered by this report has been evaluated and found to comply with the applicable requirements of the standards indicated in Section 1.0.			
Completed by:	Alvin Yeung	Reviewed by:	Nick Lee
Title:	Supervisor	Title:	Manager
Signature:	Digitally signed by Alvin Yeung	Signature:	Nick Lee cn=Nick Lee, o=Intertek Testing Services Hong Kong Ltd., ou, email=nick.lee@intertek.com, c=HK

9.0 Correlation Page For Multiple Listings	
The following products, which are identical to those identified in this report except for model number and Listee name, are authorized to bear the ETL label under provisions of the Intertek Multiple Listing Program.	
BASIC LISTEE	The NOCO Company
Address	30339 Diamond Parkway #102 GLENWILLOW OH 44139-5400
Country	USA
Product	Air Compressor

MULTIPLE LISTEE 1	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 1 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 2	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 2 MODELS	BASIC LISTEE MODELS

MULTIPLE LISTEE 3	None
Address	
Country	
Brand Name	
ASSOCIATED MANUFACTURER	
Address	
Country	

MULTIPLE LISTEE 3 MODELS	BASIC LISTEE MODELS

10.0 General Information

The Applicant and Manufacturer have agreed to produce, test and label ETL Listed products in accordance with the requirements of this Report. The Manufacturer has also agreed to notify Intertek and to request authorization prior to using alternate parts, components or materials.

COMPONENTS

Components used shall be those itemized in this Intertek report covering the product, including any amendments and/or revisions.

LISTING MARK

The ETL Listing mark applied to the products shall either be separable in form, such as labels purchased from Intertek, or on a product nameplate or other media only as specifically authorized by Intertek. Use of the mark is subject to the control of Intertek.

The mark must include the following four items:

1) applicable country identifiers "US" and/or "C" or "US", "C" and "EU"
2) the word "Listed" or "Classified" or "Recognized Component" (whichever is appropriate)
3) a control number issued by Intertek
4) a product descriptor that identifies the standards used for certification. Example:

For US standards, the words, “Conforms to” shall appear with the standard number along with the word, “Standard” or “Std.” Example: “Conforms to ANSI/UL Std. XX.”

For Canadian standards, the words “Certified to CAN/CSA Standard CXX No. XX.” shall be used, or abbreviated, “Cert. to CAN/CSA Std. CXX No. XX.”

Can be used together when both standards are used.

If all standards on the ATM have the same standard title, the shared title or its abbreviation may be used in place of the examples above. Example: "Medical Electrical Equipment" or "MEE"; "Information Technology Equipment" or "ITE"; "Audio/Video Information And Communication Technology Equipment" or "A/V ICTE".

Note: A facsimile must be submitted to Intertek, Attn: Follow-up Services for approval prior to use. The facsimile need not have a control number. A control number will be issued **after signed Certification Agreements** have been received by the Follow-up Services office, approval of the facsimile of your proposed Listing Mark, satisfactory completion of the Listing Report, and scheduling of a factory assessment in your facility.

MANUFACTURING AND PRODUCTION TESTS

Manufacturing and Production Tests shall be performed as required in this Report.

FOLLOW-UP SERVICE

Periodic unannounced audits of the manufacturing facility (and any locations authorized to apply the mark) shall be scheduled by Intertek. An audit report shall be issued after each visit. Special attention will be given to the following:

1. Conformance of the manufactured product to the descriptions in this Report.
2. Conformance of the use of the ETL mark with the requirements of this Report and the Certification Agreement.
3. Manufacturing changes.
4. Performance of specified Manufacturing and Production Tests.

In the event that the Intertek representative identifies non-conformance(s) to any provision of this Report, the Applicant shall take one or more of the following actions:

1. Correct the non-conformance.
2. Remove the ETL Mark from non-conforming product.
3. Contact the issuing product safety evaluation center for instructions.

10.1 Evaluation of Unlisted Components

Because Unlisted Components are uncontrolled, and they do not fall under a third party follow up program, Intertek may require these components to be tested and/or evaluated at least once annually, more often for certain components, as part of the independent certification process. The Unlisted Components in Section 5.0 require testing and/or evaluation as indicated.

The Applicant will be notified, in writing, via the applicable contact methods, as defined in Section 1.0, when these components must be selected and sent to Component Evaluation Center (CEC) for re-evaluation.

Due to particular testing requirements, some components may be requested to be shipped to specific labs. Thus, specific shipment destination(s) for each sample will be provided in the written notification.

Managing CEC Location:
Intertek Testing Services Hong Kong Limited
ETL Component Evaluation Center
Unit H, 3/F., Garment Centre, 576 Castle Peak Road
Kowloon, Hong Kong
Attn: Sample Room
Sample Disposition: Due to the destructive nature of the testing, all samples will be discarded at the conclusion of testing unless, the manufacturer specifically requests the return of the samples. The request for return must accompany the initial component shipment.

11.0 Manufacturing and Production Tests

Required Tests

None

12.0 Revision Summary				
The following changes are in compliance with the declaration of Section 8.1:				
Date/ Proj # Site ID	Project Handler/ Reviewer	Section	Item	Description of Change
				None