SUR-RON LIGHT BEE
TROUBLESHOOTING GUIDE
虬龙轻蜂检测及维修手册

Applicable to Light Bee Original(Square wave) Version、
Light Bee X Version and Light Bee L1e Version

轻蜂方波版、X版、道路版通用

2020-YQ2A-01

虬龙科技有限公司

Electronic control system inspection and maintenance guide
电控系统检查维修方案

A. Bike has no power

Switch on the ignition key, speedometer, tail light& head light not turned on and twist throttle bike has no respond.

一。整车不通电的情况

注释：打开钥匙，仪表、尾灯不亮，扭油门车不能动

B. Bike has power but not move

Switch on the ignition key, speedometer, tail light& head light turned on and twist throttle bike has no respond.

二。整车通电但车不能动

注释：打开钥匙，仪表、尾灯亮起，扭油门车不能动

Bike has no power situation

整车不通电的情况

1.Check battery percentage 检查电池电量

If battery LCD screen has no display, please charge the battery first, then do the troubleshooting.(if the battery over discharged, you need start the battery activation process first to active the battery.)

如电量无显示，应先充电，然后测试（如电池过放，则需要按操作步骤激活电池）

If battery LCD screen has correct display, please use another battery to test, if the bike working properly, we can confirm that the bike electric system is fine but the battery has issue.(check battery troubleshooting guide)

如电量显示正常，更换另一组电池测试，更换后车子正常则为电池故障。（电池故障需要使用单独的检测方法）

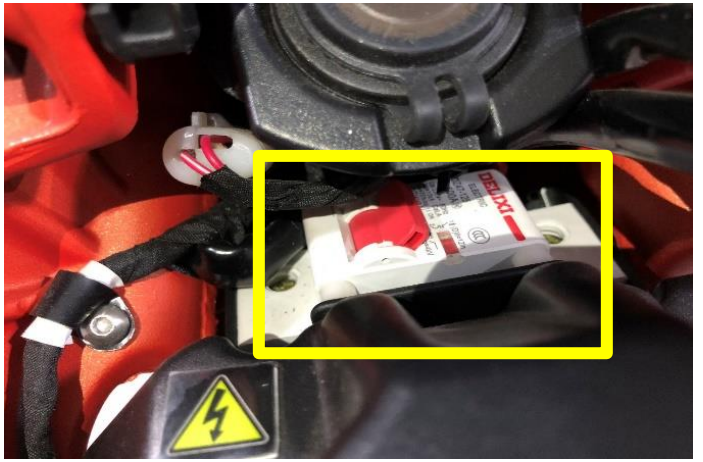
Bike has no power situation整车不通电的情况

2.Check air circuit switch检查总开关是否打开

Make sure the air circuit switch is switched on. Figure below shown switched on condition.

If the air circuit switch is turned on, but the bike still has no power, please check whether the air circuit switch is malfunctioned or not.

注意：其他三项都没问题时，注意检查空开本身是否故障。
图中空开为打开状态
空开在打开后，车辆还是不能通电，
则需使用万用表检查空开本身是否故障

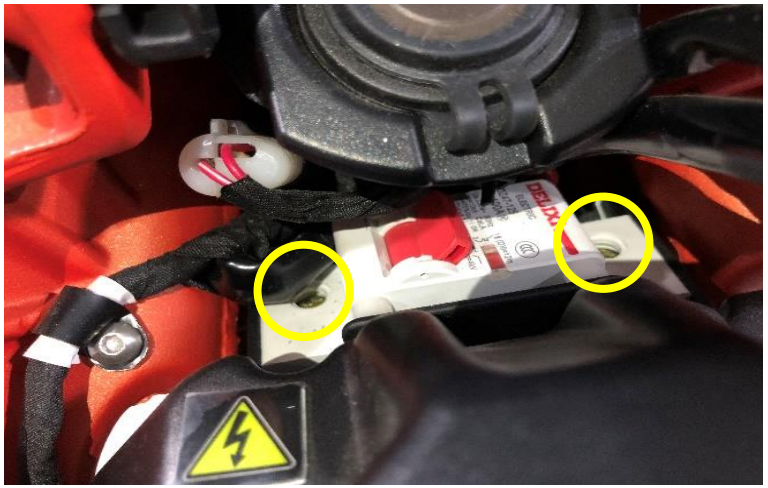


Bike has no power situation整车不通电的情况

Air circuit switch troubleshooting guide: use multimeter, set to continuity mode. See figure below, keep the air circuit switch on, use two probes to touch two bolts on the each side of the air circuit switch, then you can determine whether the air circuit switch is malfunctioned or not.

空开故障排查方式：使用万用表，调为二极管检测状态。保持空开在打开状态

分别使用正负极探针接触空开两端的螺丝，二极管亮则空开正常，二极管不亮则空开故障。



Bike has no power situation整车不通电的情况

3.Check main fuse检查保险管状态

Under the ignition key cap and around air circuit switch, you can find main fuse box.

检查：打开保险管盒，检查保险丝是否断开

维修：如断开，更换新的保险管

Step 1：find main fuse box
找到保险管盒

Step 2：open main fuse box, one is connected to main wiring loom, another is backup fuse
打开保险管盒，有线连接的是使用中的，另一个为备用

Step 3. check fuse, replace new fuse if blown.
Fuse type：5A 250V
Picture below is a good fuse
检查保险丝是否断开，如已断开，更换备用的保险管。
保险管规格：5A 250V
图中保险管中的保险丝为正常状态，溶毁的保险丝为断开状态

Bike has no power situation整车不通电的情况

4.Check ignition key switch检查电门锁是否正常

Disconnect the ignition key switch, short circuit main loom side plug, if the bike power back on, the ignition key switch need to be replaced.

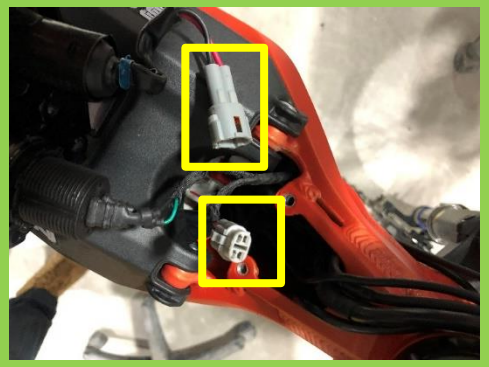
拔掉电门锁连接线，短接主线端的插头，如短接后通电则是电门锁故障

Step 1：Disassemble the ignition key switch cap by remove two bolts (see figure below), find ignition key switch plug

拆开电门锁盖（两个螺丝）找到电门锁插头

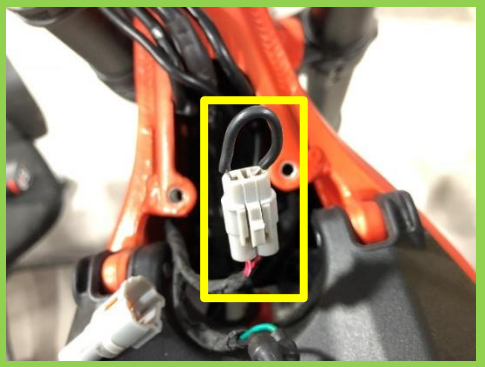
Bike has no power situation整车不通电的情况

Step 2. disconnect plug
断开插头



Step 3. use a short wire, make sure its conductive, and make sure you are safe
找一根电线，裸露两头的铜线

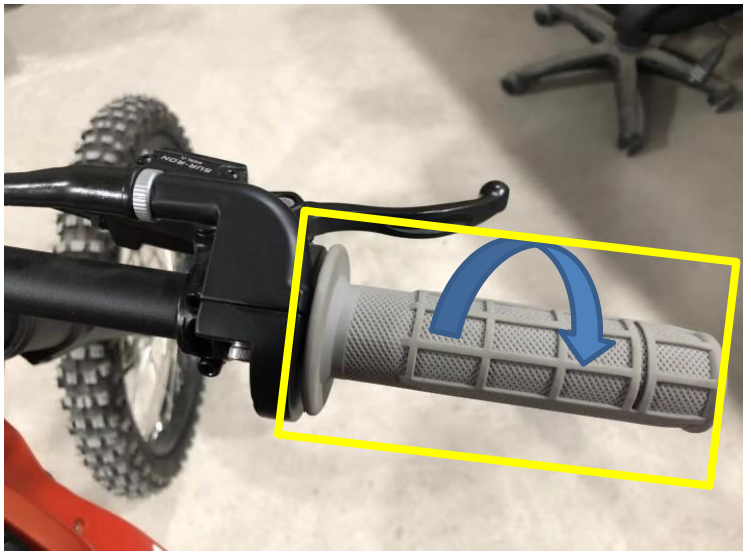
Step 4：connect the short wire to main loom side plug, see figure below
连接主线端的插头



Bike has power but no move整车通电但车不能动

1. Check throttle cable first, whether the throttle “sticky/loose” or not, make sure the throttle cable was not too tighten, loose or stuck (After crash or any accident, the throttle cable might be damaged, make sure you check the throttle cable before your next ride). This might trigger controller protection, recover when throttle cable repaired.

检查油门转把是否归为，油门拉索是否过紧，油门回位动作是否顺畅，油门拉索是否卡住。（摔车后有一定概率损伤油门拉索，注意检查）这些故障可能导致防飞车保护，调整至正常状态后恢复



Bike has power but no move整车通电但车不能动

Throttle cable stuck, turn on switch will trigger protection
油门线卡住，开启钥匙后会启动防飞车保护

Throttle cable too tight, turn on switch will trigger protection
油门线太紧，开启钥匙后会启动防飞车保护

Bike has power but no move整车通电但车不能动

2. Eliminate power protection function (disconnect 12v converter)

Attention : disconnect converter will disable headlight, tail light and speedometer.

排除断电保护（拔掉12v转换器）注意：拔除转换器后，大灯、仪表不会亮。

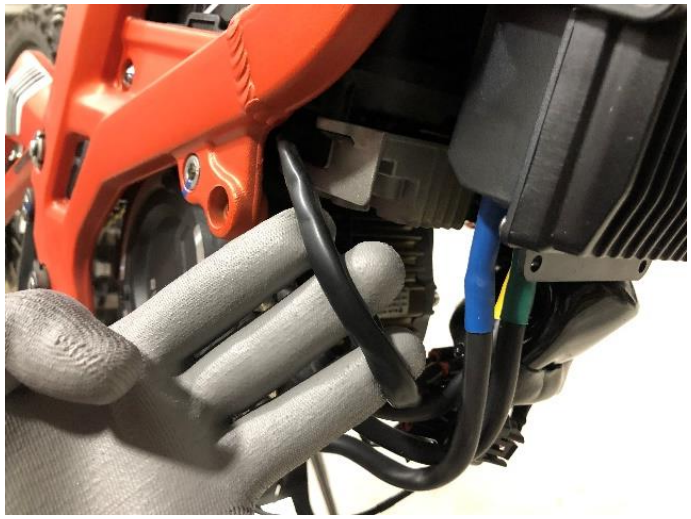
Step 1：Remove four bike bash guard bolts
颗拆除护底螺丝（共四）

Step 2：Remove controller protection guard
拆除控制器底部塑料护板

Step 3：Remove cable tie on the rubber plug protection cover from main loom
打开插头保护罩的束带

Bike has power but no move
整车通电但车不能动

Step 4：Find and disconnect 12V converter找到转换器并拔除插头



Test the bike after disconnect 12V converter, If the electric motor back to functional，then we can confirm that the 12V converter was malfunction.

Since we confirm the 12V converter was malfunction, check all the power protection functions respectively.

- 然后试车，如果车轮可以转动，则是转换器或其他保护功能问题
- 检查方法：拔除后，3个断电保护功能失效。如车可以工作，逐一排除断电保护功能

Bike has power but no move

整车通电但车不能动

3.Check throttle controller调速中控器检查

Keep the bike power on, find the throttle controller cable(see figure below).

保持整车通电状态，找到调速中控插头

A. Black probe insert to the black/white wire port黑笔插黑白线头

B. Red probe insert to the red/white wire port, the correct voltage should around to 4.3V红笔插红白线头，正常电压4.3V

C. Keep black probe insert to the black/white wire port, then insert the red probe to the green/white wire port, twist the throttle, the correct voltage should around between 0.8 to 3.6V红笔插绿白线头，扭动油门把手，正常电压0.8-3.6V

Bike has power but no move
整车通电但车不能动

4.Disconnect the front and rear brake power protection function
前后刹车断电保护：拔除插头

Step 1：find brake power protection function sensor cable
找到刹车断电感应线

Step 2：remove the ignition key switch cap, find the sensor plug and disconnect the plug。Put the bike on the stand, lift the side stand, test the bike, if the motor back to work, then we can confirm the brake power protection malfunction, replace new part to repair.
顺着线找到车身内部的插头，并拔除。然后试车，如果车轮转动，则是刹车断电保护功能异常，更换断电保护感应开关。

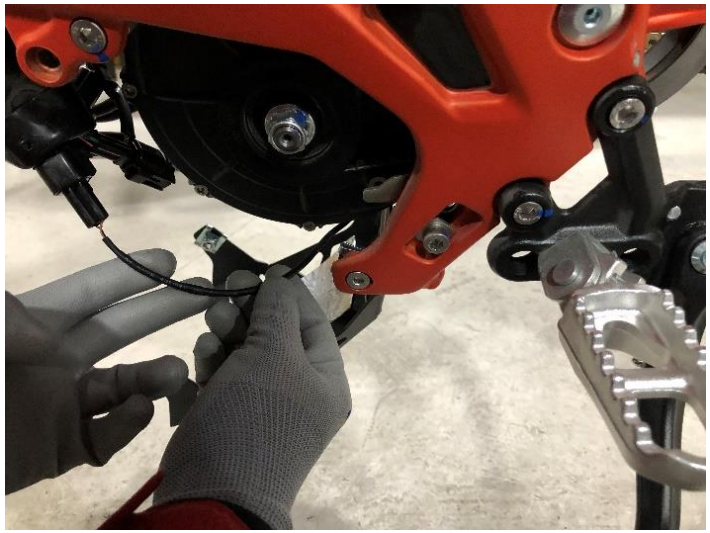
Bike has power but no move
整车通电但车不能动

5. Check side stand protection脚撑断电保护：拔除插头

Find the side stand protection sensor cable from side and disconnect the plug.

Put the bike on the stand, lift the side stand, test the bike, if the motor back to work, then we can confirm the side stand protection malfunction, replace new part to repair.

顺着脚撑断电感应开关的线找到插头，并拔除。然后试车。如车轮转动，则是脚撑断电感应开关功能异常，更换此配件



Bike has power but no move
整车通电但车不能动

6. Check tilt switch sensor倾倒断电保护：拔除插头

Step 1：Turn off air circuit switch，disconnect communication plug and power plug，remove battery off the battery rack.
关掉空气开关，拔掉数据线插头（注意松开卡扣再拔），拔掉电源插头（紧握插头本体，严禁拉线），取出电池




Step 2：Open the front battery plate
打开电池仓内的前挡板


Bike has power but no move

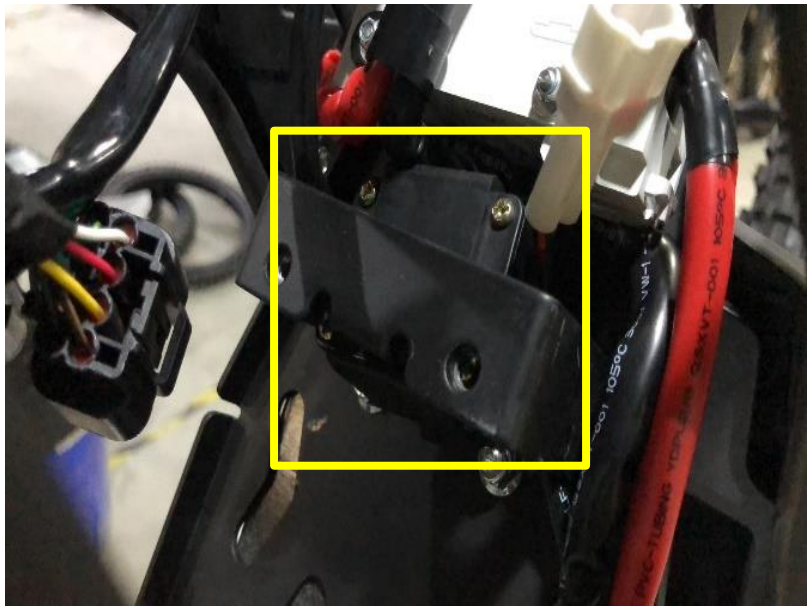
整车通电但车不能动

Step 3：Find the tilt switch sensor, see figure below, disconnect the plug.

Put the bike on the stand, lift the side stand, test the bike, if the motor back to work, then we can confirm the tilt switch sensor malfunction, replace new part to repair.

找到倾倒感应器，拔除它与主线的插头，然后试车

如果车轮正常转动，则是倾倒开关故障，更换掉问题零件



Bike has power but no move
整车通电但车不能动

7.Check motor检查电机

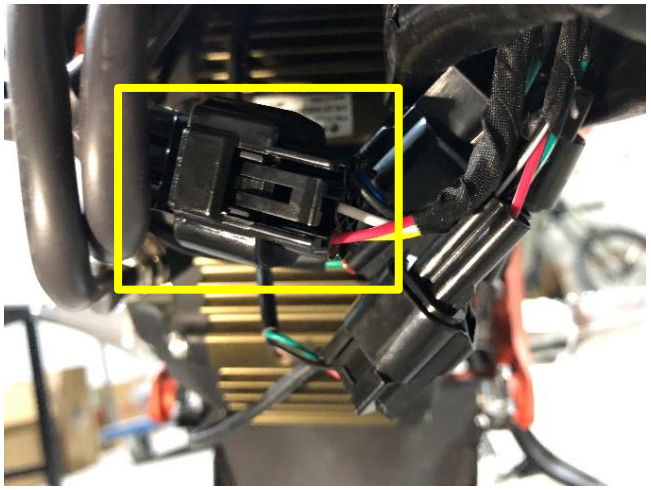
Keep the bike power ontesting the motor hall voltage，you need multimeter，set the multimeter to 0-20V Voltage

保持整车通电状态

测量电机霍尔电压，需用到万用表，调至0-20V

Step 1, find hall sensor connector (six pin multiblock)

第一步：找到电机霍尔插头（六线插头）



Bike has power but no move

整车通电但车不能动

Step 2, black probe insert to the black wire port，red probe insert to the red wire port，measure the voltage, the voltage should between 4.0 to 4.3V；

Put your bike on the bike stand, leave the rear wheel off the ground, keep the black probe in the black wire port, red probe insert yellow port, turn the rear wheel gently and slowly, the voltage should shown jumping between 0V to about 4.3V. Measure the green and blue port use the same method respectively, the result should be the same.

Voltage lower than 4V means hall sensor is malfunctioned.

黑笔插黑线头尾部，红笔插红线，测量电压 电压4.0-4.3V之间，低于4V则是霍尔故障。需要区分是电机霍尔故障还是控制器霍尔故障

红笔分别插黄、绿、蓝，用手拨动后轮，万用表电压0-4.3V之间变换。

Carefully measure the Voltage, the needle probe could damage the seal ring of the multiblock, or even the wire itself. Highly recommend you to insert from outside of the seal ring, close to the plastic part.

注意确保万用表金属针接触到插头金属部分，插入的时候靠黑色塑料边缘插入，不要靠线插入

Bike has power but no move

整车通电但车不能动

8. CHECK CONTROLLER控制器检查

Keep the bike power on

Unplug the motor hall sensor connector, check main harness six pin multiblock

保持整车通电状态

拔掉电机霍尔插头，检查主线端6线插头

Step 1, set the multimeter to 0-20V Voltage

(easier to measure by remove the yellow block from connector)

万用表 调至直流电0-20V。拔除插头中的黄色档块，测量更容易

Step 2, black probe insert to the black wire port，

red probe insert to the yellow, green and blue wire port，

measure the voltage, normal voltage should between 4.5-4.7V

黑笔插黑线端，红笔分别测试黄、绿、蓝，正常电压4.5-4.7V

注意：如有备用控制器，可以直接更换新的控制器快速排除

Diagnostic Identification Chart

No.	LED	Diagnostic explanation	Diagnostic code	Solution
	Number of flash times		Shown on instrument	
1	1	normal operation condition	----	----
2	2	controller power tube malfunction	Er-208	turn off power switch and turn on again
3	3	controller hardware over current protection	Er-207	leave throttle to idle position and twist throttle again
4	4	controller software over current protection	Er-206	auto recovery
5	5	motor main cable phase malfunction	Er-205	turn off power switch and turn on again
6	6	motor Hoare coil malfunction	Er-204	turn off power switch and turn on again
7	7	motor stall protection	----	leave throttle to idle position and twist throttle again
8	8	controller level. 1 over temperature protection	Er-202	turn off power switch and turn on again
9	9	controller level. 2 over temperature protection	Er-201	turn off power switch and turn on again
10	10	motor level. 1 over temperature protection	Er-216	turn off power switch and turn on again
11	11	motor level. 2 over temperature protection	Er-215	turn off power switch and turn on again

No.	LED	Diagnostic explanation	Diagnostic code	Solution
	Number of flash times		Shown on instrument	
12	12	battery level.2 over voltage protction	----	leave throttle to idle position and twist throttle again
13	13	battery level.2 low voltage protction	Er-213	leave throttle to idle position and twist throttle again
14	14	throttle rush-out protection	Er-212	turn off power switch and turn on again
15	15	Throttle to controller signal wire short-circuit	Er-211	turn off power switch and turn on again
16	16	brake protection	----	auto recovery
17	21	controller current sampling failure	Er-209	turn off power switch and turn on again
18	22	side stand protection	Er-224	auto recovery
19	23	tilt swith protection	Er-223	leave throttle to idle position and twist throttle again

Diagnostic Identification Chart

No.	LED Number of flash times	Diagnostic explanation	Diagnostic code Shown on instrument	Solution
20	24	key switch port power failure protection	Er-222	turn off power switch and turn on again
21	25	battery low voltage protection (level. 1)	Er-221	turn off power switch and turn on again
22	27	CAN communication malfunction	ER 217	auto recovery
23	----	communication malfunction(	ER 002	auto recovery
24	28	battery premier discharge(voltage) protection(level. 2)	Er-105	charging battery to recovery
25	29	battery discharge low temperature protection(level. 2)	Er-114	turn off power switch and turn on again
26	30	battery over temperature protection(level. 1)	Er-219	turn off power switch and turn on again
27	31	controller and battery 485 communication no response	Er-216	auto recovery
28	32	controller and battery 485 communication unmatch		auto recovery
29	33	battery SOC low capacity protection	Er-218	turn off power switch and turn on again
30	17	motor temperature sensor malfunction	Er-200	auto recovery
31	18	battery BMS discharging MOS malfunction	Er-107	recovery after fault removal
32	18	battery BMS charging MOS malfunction	Er-106	recovery after fault removal
33	19	battery BMS MOS temperature sensor malfunction	Er-102	auto recovery
34	19	battery cell temperature sensor malfunction	----	auto recovery
35	20	battery discharge over temperature protection(level. 2)	Er-116	temperature drop to working temperature to recovery
36	26	battery cell charging over temperature protection(level. 2)	----	temperature drop to working temperature to recovery

Diagnostic Identification Chart

No.	LED Number of flash times	Diagnostic explanation	Diagnostic code Shown on instrument	Solution
37	34	battery cell charging low temperature protection(level. 2)	----	temperature rise to working temperature to recovery
38	20	battery discharging MOS over temperature protection(level. 2)	----	temperature drop to working temperature to recovery
39	26	battery charging MOS over temperature protection(level. 2)	----	temperature drop to working temperature to recovery
40	20	battery BMS soft start circuit over temperature protection(level. 2)	----	temperature drop to working temperature to recovery
41	35	battery over current protection (level.3)	----	auto recovery
42	----	battery BMS discharge MOS over temperature protection(level. 1)	Er-120	temperature drop to working temperature to recovery
43	----	battery premier over discharge(voltage) protection(level. 1)	Er-119	auto recovery
44	----	battery discharge low temperature protection(level. 1)	Er-118	temperature rise to working temperature to recovery
45	----	battery discharge over temperature protection(level. 1)	Er-117	temperature drop to working temperature to recovery

故障码对应表

序号	LED 闪烁次数	故障释义	故障代码(仪表)	恢复方式
1	1	正常运行	----	----
2	2	电机控制器功率管故障	Er-208	重开电门锁
3	3	电机控制器硬件过流保护	Er-207	重拧转把
4	4	电机控制器软件过流保护	Er-206	自动恢复
5	5	电机主线缆缺相故障	Er-205	重开电门锁
6	6	电机霍尔故障	Er-204	重开电门锁
7	7	电机堵转保护	----	重拧转把
8	8	电机控制器一级过温保护	Er-202	重开电门锁
9	9	电机控制器二级过温保护	Er-201	重开电门锁
10	10	电机一级过温保护	Er-216	重开电门锁

序号	LED 闪烁次数	故障释义	故障代码(仪表)	恢复方式
11	11	电机二级过温保护	Er-215	重开电门锁
12	12	电池二级过压保护	----	重拧转把
13	13	电池二级欠压保护	Er-213	重拧转把
14	14	转把飞车保护	Er-212	重开电门锁
15	15	转把接地保护	Er-211	重开电门锁
16	16	刹车触发（高刹）	----	自动恢复
17	21	电机控制器电流采样基准故障	Er-209	重开电门锁
18	22	侧支架开启（低刹）	Er-224	自动恢复
19	23	倾倒触发（低刹）	Er-223	重拧转把
20	24	钥匙锁掉电保护	Er-222	重开电门锁

故障码对应表

序号	LED闪烁次数	故障释义	故障代码(仪表)	恢复方式
21	25	电池一级欠压保护	Er-221	重开电门锁
22	27	CAN通信故障(电机控制器检测)	ER 217	自动恢复
23	----	通信故障(仪表检测)	ER 002	自动恢复
24	28	电池初级过放(电压)保护(二级)	Er-105	充电恢复
25	29	电池放电欠温保护（二级）	Er-114	重开电门锁
26	30	电池过温一级保护	Er-219	重开电门锁
27	31	控制器与电池485通信无响应	Er-216	自动恢复
28	32	控制器与电池485通信不匹配		自动恢复
29	33	电池SOC低容量保护	Er-218	重开电门锁
30	17	电机温度传感器故障	Er-200	自动恢复

序号	LED闪烁次数	故障释义	故障代码(仪表)	恢复方式
31	18	电池BMS放电MOS损坏	Er-107	排除故障恢复
32	18	电池BMS充电MOS损坏	Er-106	排除故障恢复
35	19	电池BMS MOS温度传感器故障	Er-102	自动恢复
36	19	电池电芯温度传感器故障	----	自动恢复
37	20	电池放电过温保护（二级）	Er-116	降温后恢复
38	26	电池电芯充电过温保护（二级）	----	降温后恢复
39	34	电池电芯充电欠温（二级）	----	升温后恢复
40	20	电池放电MOS过温（二级）	----	降温后恢复

故障码对应表

序号	LED闪烁次数	故障释义	故障代码(仪表)	恢复方式
31	18	电池BMS放电MOS损坏	Er-107	排除故障恢复
32	18	电池BMS充电MOS损坏	Er-106	排除故障恢复
35	19	电池BMS MOS温度传感器故障	Er-102	自动恢复
36	19	电池电芯温度传感器故障	----	自动恢复
37	20	电池放电过温保护（二级）	Er-116	降温后恢复
38	26	电池电芯充电过温保护（二级）	----	降温后恢复
39	34	电池电芯充电欠温（二级）	----	升温后恢复
40	20	电池放电MOS过温（二级）	----	降温后恢复

序号	LED闪烁次数	故障释义	故障代码(仪表)	恢复方式
41	26	电池充电MOS过温（二级）	----	降温后恢复
42	20	电池BMS软启动电路过温（二级）	----	降温后恢复
43	35	电池三级过流	----	自动恢复
44	----	电池BMS 放电MOS过温报警（一级）	Er-120	降温后恢复
45	----	电池初级过放(电压)报警（一级）	Er-119	自动恢复
46	----	电池放电欠温报警（一级）	Er-118	升温后恢复
47	----	电池放电过温报警（一级）	Er-117	降温后恢复

THANKS !