



中国认可
国际互认
检测
TESTING
CNAS L12658

安全检测报告

报告编号：AGC-WH00125211101GS01

产品名称：酷轻松石墨烯智能发热棉服

商 标：酷轻松

产品型号：K-FRMF-BOV1

委托单位：安徽宇航派蒙健康科技股份有限公司

签发日期：2021年11月04日

报告版本：V1.0

武汉市鑫宇环检测技术有限公司

声明：

1. 检测报告无批准人签字及“报告专用章”无效。(3)
2. 本报告检测结果仅对受测样品负责。
3. 未经 AGC 书面同意，不得部分复制本报告。

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15 days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc.wuhan@agc-cert.com.

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检测报告

样品名称 : 酷轻松石墨烯智能发热棉服

型号 : K-FRMF-B0V1

数量 : 1

样品来源 : 送样

收样日期 : 2021年10月 29 日

完成日期 : 2021年11月 03 日

委托单位 : 安徽宇航派蒙健康科技股份有限公司

地址 : 安徽省合肥市蜀山区湖光东路1201号国家电子商务产业园16号派蒙大厦

制造商 : 安徽宇航派蒙健康科技股份有限公司

地址 : 安徽省合肥市蜀山区湖光东路1201号国家电子商务产业园16号派蒙大厦

生产厂 : 德州宇航派蒙石墨烯科技有限责任公司

地址 : 山东省德州市经济技术开发区袁桥镇东方红东路6596号

试验依据标准:

GB 4706.1-2005《家用和类似用途电器的安全 第1部分:通用要求》

试验结论:

合格, 详见测试条款。

测 试 张涛

张涛

审 核 刘扬明

刘扬明

批 准 伍小兵 (授权签字人)

伍小兵

试验单位: 武汉市鑫宇环检测技术有限公司



地址: 湖北省武汉市东湖新技术开发区佛祖岭街竹林小路9号武汉金能风电产业园3号厂房栋1-2层102室

备注: /

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样品描述及说明

1. 主测型号: K-FRMF-B0V1 系列型号: /
2. 额定值
额定电压或电压范围: 5V  额定电流或电流范围: 2A
额定功率或功率范围: 10W 额定频率或频率范围: /
3. 电源性质: 单相交流[] 三相交流[] 直流[☒] 交直流两用[]
4. 防触电保护类别: 0类[] 0 I 类[] I 类[] II 类[] III 类[☒]
5. 防护等级: IP X0
6. 器具类型: 便携式[☒] 手持式[] 驻立式[]
固定式[] 嵌装式[]
7. 工作方式: 连续工作[☒] 短时工作[] 断续工作[]
8. 器具控制方式: 电子线路[☒] 定时器[] 其他[]
9. 电源线插头型式: 单相两极[] 单相三极[] 三相四极[] 不适用[☒]
10. 与电源连接的方式:
不打算永久性连接到固定布线:
----装有一个插头的电源软线[]
----输入插口[]
----直接插入到输出插座的插脚[]
打算永久性连接到固定布线:
----连接固定布线电缆的一组接线端子[]
----连接柔性软线的一组接线端子[]
----组电源引线[]
----连接适当类型的电缆或导管的一组接线端子和电缆入口、导管入口、预留的现场成形孔或压盖
11. 电源线连接类型: X 连接[] Y 连接[] Z 连接[] 不适用[☒]
12. 电源线夹紧装置:
螺钉-绝缘压板式夹紧[] 迷宫式夹紧[] 模压护套式夹紧[]
压扣夹紧[] 其他:
13. 器具电源线的连接方式: 接插件式[] 螺钉式[] 钩焊[] 铆接[]
熔焊[] 压接式[] 其他: []
14. 电源线的规格: / 长度: / 截面: / mm²
15. 带滤波器: 是[] 否[☒]
16. 产品铭牌: 粘贴[] 非粘贴[☒]
17. 电源开关断接方式: 单极[] 全极[] 不适用[☒]
18. 熔断器型号、规格: /
19. 温控器: 可调式[] 不可调式[] 不适用[☒]
20. 热断路器: 自复位式[] 非自复位式[] 不适用[☒]

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21. 接地措施: 不适用 ☒ []
接地螺钉材料: 铜 ☐ [] 不锈钢 ☐ [] 其他:
提供接地连续性部件的材料: 铜 ☐ [] 不锈钢 ☐ [] 其他:
提供接地连续性部件的镀层厚度 部位及厚度: μm (可分别表示部位)
带有接地导体的可拆卸部件 ☐ []
22. 防止触及带电部件的保护方式: 安全特低电压 ☒ [] 保护阻抗 ☐ [] 防护罩 ☐ []
23. 变压器: 安全隔离变压器 ☐ [] 开关电源型变压器 ☐ [] 不适用 ☒ [] 其他:
24. 容器内压力: 与大气相通 ☐ [] 产生压力 ☐ [] (额定压力: Pa) 不适用 ☒ []
25. 更换电源线时需拆卸螺钉规格:
外壳固定螺钉直径: / mm 电源线夹紧装置螺钉直径: / mm
接地螺钉直径: / mm 电源连接螺钉直径: / mm
26. 电热元件的描述:
金属铠装元件 ☐ [] 非金属铠装元件 ☐ [] 电热丝元件 ☐ [] PTC或类似特性元件 ☐ []
电热膜或类似电热膜状元件 ☒ [] 红外线或类似特性元件 ☐ [] 卤素或类似特性元件 ☐ []
其他 ☐ []
27. 电机元件的描述:
电容电机 ☐ [] 罩极电机 ☐ [] 串励电机 ☐ [] 直流电机 ☐ [] 其他 ☐ [] 不适用 ☒ []
28. 产品特殊描述:
1) 本产品为石墨烯智能发热棉服, 通过外部5V直流电源供电, 最大功率为10W, 属于III类器具;
2) 根据客户委托要求, 按GB4706.1-2005进行检测;

一般评述:

“P”表示该项检验方法/结果符合标准要求;

“F”表示该项检验不符合标准要求;

“N”表示该项要求不适用。“ (见附表)”指本报告的附加表格。

本报告出现的试验结果仅与试验样品有关。

除非全部复制, 否则无实验室书面批准本报告不得部分复制。本报告模板编号: AGC-TRF-SA-13B。

产品铭牌:

酷轻松石墨烯智能发热棉服

型号: K-FRMF-B0V1

额定电压: 5V  2A

额定功率: 10W

安徽宇航派蒙健康科技股份有限公司



检测结果汇总

序号	检测项目	检测条款	判定结果
1	标识标志 (标志和说明)	条款 7	P
2	对触及带电部件的防护	条款 8	P
3	输入功率和电流	条款 10	P
4	发热	条款 11	P
5	工作温度下的泄漏电流和电气强度	条款 13	N
6	耐潮湿	条款 15	N
7	泄漏电流和电气强度	条款 16	N
8	非正常工作	条款 19	P
9	稳定性和机械危险	条款 20	N
10	机械强度	条款 21	N
11	结构	条款 22	P
12	内部布线	条款 23	N
13	元件	条款 24	N
14	电源连接和外部软线	条款 25	N
15	外部导线用接线端子	条款 26	N
16	接地措施	条款 27	N
17	螺钉和连接	条款 28	N
18	电气间隙、爬电距离和固体绝缘	条款 29	N
19	耐热和耐燃	条款 30	N
备注: /			

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GB 4706.1			
条款	标准要求	试验结果	判定
5	试验的一般条件		P
	试验按第 5 章的规定进行, 如电源性质、试验顺序		P

6	分类		P
6.1	电击防护 (0、0I、I、II、III 类器具)	III 类器具	P
6.2	对水有害浸入的防护	IPX0	N

7	标志和说明		P
7.1	额定电压或额定电压范围 (V)	5V	P
	电源性质	==	P
	额定频率 (Hz)		N
	额定输入功率 (W) 或额定电流 (A)	2A	P
	制造厂名或责任承销商的名称、商标或识别标志	安徽宇航派蒙健康科技股份有限公司	P
	器具型号、规格	K-FRMF-B0V1	P
	IEC 60417 中的符号 5172 (仅对 II 类器具)		N
	防水等级的 IP 代码 (IPX0 不标出)		N
	适用时, 连接水源的外部软管组件中的电动水阀外壳应按 GB/T5465.2 标注符号		N
7.2	用多种电源的驻立式器具, 其标志应有下述内容:		N
	“警告: 在接近接线端子前, 必须切断所有的供电电路。”		N
	此警告语应位于接线端子罩盖的附近。		N
7.3	正确地标示额定值范围		N
7.4	不同额定电压的设定应清晰可辨		N
7.5	标出每一额定电压所对应的额定输入功率或额定电流		P
	额定功率或额定电流的上、下限与额定电压的对应关系明确		N
7.6	正确使用符号		N
7.7	配备正确的接线图, 并固定在器具上		N

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GB 4706.1			
条款	标准要求	试验结果	判定
7.8	除 Z 型连接以外:		N
	—— 专门连接中线的接线端子用字母 N 标明		N
	—— 保护接地端子用符号  标明		N
	—— 标志不应设置在可拆卸的部件上		N
7.9	对于可能引起危险的开关, 其标志或位置应能清楚地表明其控制的部件		N
7.10	开关和控制器应用数字、字母或其它方式表示		N
	数字“0”只能表示“断开”档位, 除非不致引起与“断开”档位相混淆		N
7.11	控制器应标出调节方向		N
7.12	使用说明(书)应随器具一起提供, 以保证器具能安全使用		P
7.12.1	应提供安装或维护保养的详细内容		P
7.12.2	若驻立式器具没有电源软线和插头, 也没有其他全极断开装置, 则说明(书)中应指出固定线路中必备的断开装置		N
7.12.3	若固定布线的绝缘能与温升超过 50K 的那些部件接触, 则说明(书)应指出固定布线必备的防护		N
7.12.4	嵌装式器具的使用说明(书)中应有下述明确信息:	非嵌装式器具	N
	—— 空间尺寸		N
	—— 支撑和固定的尺寸和位置		N
	—— 与周围器具的最小间距		N
	—— 通风孔的最小尺寸和正确布置		N
	—— 器具与电源连接以及各分离元件的互连方法		N
	—— 器具安装后能够断开电源连接, 除非		N
	器具带有符合 24.3 规定的开关		N
7.12.5	X 型连接的器具(专门制备的软线), 更换软线的说明		N
	Y 型连接的器具, 更换软线的说明		N
	Z 型连接的器具, 更换软线的说明		N
7.12.6	带有非自复位热断路器的电热器具的使用说明	无此类元件	N

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GB 4706.1			
条款	标准要求	试验结果	判定
7.12.7	固定式器具的使用说明中应阐明如何将器具固定在支撑物上		N
7.12.8	对于连接到水源的器具, 说明中应指出	非此类器具	N
	—— 最大进水压力 (Pa)		N
	—— 最小进水压力 (Pa), 如有必要		N
	对于由可拆除软管组件连接水源的器具, 应声明使用器具附带的新软管, 旧软管组件不能重复利用		N
7.13	使用说明(书)和本标准要求的其它文本, 应使用销售地所在国的官方语言		P
7.14	所使用的标志应清晰易读, 持久耐用		P
7.15	器具上的标志应标在器具的主要部位上		P
	标志从器具外面应清晰可见(必要时移开罩盖)		N
	对于便携式器具, 应不借助工具就能打开罩盖	非便携式器具	N
	驻立式器具按正常使用就位后, 至少制造厂或责任承销商的名称、商标或识别标志, 产品的型号和规格应可见		N
	固定式器具按说明安装就位后, 至少制造厂或责任承销商的名称、商标或识别标志, 产品的型号和规格应可见		N
	开关和控制器的标示应标在该元件上或其附近; 若会引起误解则不应装在可改变位置的部件上		N
7.16	可更换的热熔体或熔断器, 其牌号或类似标示应在更换时清晰可见		N

8	对触及带电部件的防护		P
8.1	应有足够的防止意外触及带电部件的防护	III类器具	N
8.1.1	所有状态, 包括取下可拆卸部件后的状态		N
	装取灯泡期间, 应有对触及带电部件的防护		N
	用 IEC61032 中的探棒 B 进行检查, 不触及带电部件		N
8.1.2	用 IEC61032 中的探棒 13 检查 0 类器具、II 类器具或 II 类结构上的孔隙, 不触及带电部件		N
	用探棒 13 检查有绝缘涂层的接地金属外壳上的孔隙, 不触及带电部件		N

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GB 4706.1			
条款	标准要求	试验结果	判定
8.1.3	II 类器具以外的其它器具用 IEC 61032 的 41 号试验探棒, 应不能触及可见灼热元件的带电部件		N
8.1.4	若易触及部件为下述情况可认为不带电:		P
	—— 由交流安全特低电压供电: 电压峰值 $\leq 42.4V$		N
	—— 由直流安全特低电压供电: 电压 $\leq 42.4V$	5VDC供电	P
	—— 或通过保护阻抗与带电部件隔开, 直流电流 $\leq 2mA$		N
	—— 或通过保护阻抗与带电部件隔开, 交流峰值电流 $\leq 0.7mA$		N
	—— $42.4V < \text{峰值电压} \leq 450V$ 其电容量 $\leq 0.1 \mu F$		N
	—— $450V < \text{峰值电压} \leq 15kV$, 其放电量 $\leq 45 \mu C$		N
8.1.5	器具在就位或组装之前, 带电部件至少应由基本绝缘保护:		N
	—— 嵌装式器具		N
	—— 固定式器具		N
	—— 分离组件形式交付的器具		N
8.2	II 类器具和 II 类结构, 应对基本绝缘以及仅由基本绝缘与带电部件隔开的金属部件有足够的防止意外接触的保护		N
	只允许触及由双重绝缘或加强绝缘与带电部件隔开的部件		N

10	输入功率和电流		P
10.1	器具在正常工作温度下, 输入功率与额定功率的偏差不应超过标准规定的范围。额定功率; 实测功率; 偏差:	(见附表)	P
10.2	器具在正常工作温度下, 电流与额定电流的偏差不应超过标准的规定的范围。额定电流; 实测电流; 偏差:		N

11	发热		P
11.1	在正常使用中, 器具和其周围环境的温度不应过高		P
11.2	按规定放置和固定器具		P

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GB 4706.1			
条款	标准要求	试验结果	判定
11.3	除绕组外, 用热电偶测定温升		P
	绕组的温升用阻值法测定, 除非		N
	绕组不均匀或难以正确接线		P
11.4	电热器具在正常工作状态下以 1.15 倍额定输入功率工作	1.15x10=11.5W	P
11.5	电动器具以 0.94 倍和 1.06 倍额定电压之间的最不利电压供电, 在正常状态下工作		N
11.6	组合器具以 0.94 倍和 1.06 倍额定电压之间的最不利电压供电, 在正常状态下工作		N
11.7	器具工作的时间一直延续至正常使用时那些最不利条件产生所对应的时间		P
11.8	温升不超过表 3 的限定值		P
	保护装置不应动作	无保护装置	N
	密封剂不应流出		N
	如通过 24.1.4 规定的循环周期的测试, 则允许保护电子电路中的部件动作		N

13	工作温度下的泄漏电流和电气强度		N
13.1	工作温度下, 器具的泄漏电流不应过大, 并且有足够的电气强度	III 类器具	N
	电热器具以 1.15 倍额定输入功率工作		N
	电动器具和联合器具以 1.06 倍额定电压供电		N
	在试验前断开保护阻抗和无线电干扰滤波器		N
13.2	泄漏电流通过 IEC60990 中图 4 所描述电路进行测量		N
	泄漏电流的测量		N
13.3	绝缘的电气强度试验		N
	在试验期间不应出现击穿		N

14	瞬态过电压		N
	器具应耐受可能经受的瞬态过电压		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	小于表 16 规定值的电气间隙应经受脉冲电压试验, 试验电压为表 6 的规定值		N
	除了下述情况外, 不应出现闪络		N
	如果当电气间隙短路时器具符合 19 章的规定, 允许出现功能性绝缘的闪络		N

15	耐潮湿		N
15.1	器具外壳按器具分类提供相应的防水等级	IPX0	N
	按 15.1.1 和 15.1.2 的规定检查器具的符合性, 随后立即经受 16.3 规定的电气强度试验		N
	绝缘上没有使电气间隙和爬电距离低于 29 章规定值的液体痕迹		N
15.1.1	器具按规定 IEC 60529 经受试验		N
	连接水源的外部软管组件中的电动水阀如果含有带电部件, 则要按照 IPX7 类器具进行防水试验		N
15.1.2	手持式器具在试验期间要通过最不利位置连续转动		N
	嵌装式器具按照制造商的说明书安装就位		N
	通常在地面或桌面上使用的器具按要求放置		N
	通常固定在墙上器具和带插脚的器具按要求放置		N
	对 IPX3 类器具, 墙装式器具底面与摆管转动轴在同一水平面上		N
	对 IPX4 类器具, 器具的水平中心线要与摆管的转动轴心线一致, 摆管沿垂线两边各摆动 90°, 持续时间 5min, 且		N
	—— 对通常在地面或桌面上使用的器具, 支撑物放在摆管摆动轴心线高度上		N
	—— 对使用说明中要求靠近地平面放置的墙壁安装器具, 按使用说明放置		N
	—— 对通常固定在天花板上的器具按要求放置		N
	X 型连接器具应装有表 13 规定最小横截面积允许的最轻型柔性软线, 除非		N
	适用时可拆卸部件按要求进行试验		N
15.2	溢出的液体不应影响器具的电气绝缘		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	X 型连接的器具安装规定的软线		N
	对带有输入插孔的器具, 以最不利情况选择安装或不安装连接器		N
	拆除可拆卸部件		N
	立即经受 16.3 条规定的电气强度试验		N
	绝缘上没有使电气间隙和爬电距离低于 29 章规定值的液体痕迹		N
15.3	器具应能承受正常使用中可能出现的潮湿条件		N
	48 小时潮湿处理		N
	经受 16 章的试验		N

16	泄漏电流和电气强度		N
16.1	器具的泄漏电流不应过大, 并且有足够的电气强度		N
	试验前应断开保护阻抗		N
16.2	单相器具: 测试电压为 1.06 倍额定电压		N
	三相器具: 测试电压为 1.06 倍额定电压除以 $\sqrt{3}$		N
	泄漏电流的测量		N
16.3	按表 7 进行电气强度试验		N
	试验期间不应出现击穿		N

17	变压器和相关电路的过载保护		N
	器具带由变压器供电的电路, 应使得在正常作用中可能出现短路时, 该变压器内或与变压器相关的电路中, 不会出现过高的温度。		N
	通过施以正常使用中可能出现的最不利的短路或过载, 供电电压为 1.06 倍或 0.94 倍的额定电压, 取最不利的情况		N
	安全特低电压电路中的导线绝缘层的温升值, 不应超过表 3 中的有关规定值的 15K		N
	绕组的温度不应超过表 8 中的规定值。		N

19	非正常工作		P
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GB 4706.1			
条款	标准要求	试验结果	判定
19.1	在非正常或误操作情况下应避免引起火灾危险、机械性损坏		P
	电子电路的设计和应用, 应保证其任意故障都不导致器具不安全		P
19.2	带电热元件器具应在限制其热散发的条件下进行试验; 试验电压 (V): 0.85 倍额定输入功率		P
19.3	重复 19.2 条试验, 试验电压 (V): 1.24 倍额定输入功率		P
19.4	按 11 章的试验条件进行, 输入功率为 1.15 倍额定输入功率, 并将 11 章试验期间用来限制温度的任一控制器短路		N
19.5	对于装有带管状外鞘或埋入式电热元件的 0I 类和 I 类器具, 重复 19.4 试验。但控制器不短路, 而电热元件的一端要与其外鞘相连接		N
	器具电源极性颠倒, 并且在电热元件的另一端与外鞘相连的情况下, 重复上述试验		N
	打算永久连到固定布线的器具和在 19.4 的试验期间出现全极断开的器具不进行此试验		N
19.6	对带有 PTC 电热元件的器具, 以额定电压供电, 达到稳定状态		N
	将 PTC 电热元件上的电压增加 5%, 并让器具再次稳定, 重复该程序, 直到 PTC 电热元件的电压达到 1.5 倍的额定电压, 或电热元件破裂		N
19.7	如果转子堵转转矩小于满载转矩的器具用锁住转子的方法, 其他的器具用锁住运动部件的方法做失速试验		N
	转子堵转, 如有要求, 电机电容应开路或短路		N
	对每一次试验, 带有定时器或程控器的器具以额定电压供电, 持续时间应等于允许的最长时间		N
	额定电压下的试验持续时间或直至稳定状态建立所需时间		N
	绕组温度不应超过限定温度; 器具类型; 绝缘等级; 实测温度 (°C)	见附表	N
19.8	三相电动机, 断开一相, 在额定电压下工作		N
19.10	串激电机以 1.3 倍的额定电压, 持续运转 1min		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	器具的安全不受损害, 绕组和连接装置不应有工作松动。		N
19.11	除非符合 19.11.1 规定的条件, 否则应通过对所有的电路或电路上的零件进行 19.11.2 规定的故障评估来检查电子电路的合格性		P
	带保护性电子电路的器具经受 19.11.3 和 19.11.4		N
	带有如下开关的器具应进行 19.11.4 的试验:		N
	—— 由电子线路断开获得断开位置的开关		N
	—— 带有使器具处于待机状态的开关		N
19.11.1	对于同时满足下述两个条件的电路或电路中的零件, 不必进行 19.11.2 中 a) 到 f) 的故障试验:		P
	—— 此电子线路是低功率电路, 即按规定进行试验, 在低功率点的最大功率不超过 15W	10W	P
	—— 对电击、火灾危险、机械危险或危险的功能失常的保护, 不依赖于此电子电路的正常工作		N
19.11.2	器具在 11 章规定的条件下以额定电压工作, 每次施加一个故障条件, 试验持续时间按照规定要求:		N
	a) 如果电气间隙或爬电距离小于 29 章中规定的值, 将功能性绝缘短路		N
	b) 在任何元件接线端处开路		N
	c) 电容器短路, 符合 GB/T 14472 的电容器除外		N
	d) 非集成电路电子元件的任何二个接线端短路 该故障条件不施加在光耦合器的二个电路之间		N
	e) 三端双向可控硅开关元件以二极管方式失灵		N
	f) 集成电路故障。在此情况下要评估器具可能出现的所有危险情况, 以确保其安全性不依赖于这一元件的正常功能		N
19.11.3	若器具具有保护性电子电路, 其保证器具符合第 19 章要求的, 则按照 19.11.2 中 a) 至 f) 所述, 模拟单一的故障条件重复相关的试验		N
	在每一试验期间和试验后, 必须进行如下检查:		N
	—— 绕组的温升不应超过表 8 的限值		N
	—— 器具应符合 19.13 所规定的条件		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	—— 通过保护阻抗的电流不能超过 8.1.4 的规定限值		N
	如果一个印刷电路板的导线变为开路, 只要同时满足下述三个条件, 此器具可被认为已经受了该特殊试验:		N
	—— 印刷电路板的材料经受附录 E 规定的燃烧试验		N
	—— 任何导线的松脱, 都不使带电部件和易触及金属部件之间的爬电距离或电气间隙减小到低于第 29 章规定的值		N
	—— 器具在开路导线桥接的情况下, 经受 19.11.2 的试验		N
19.11.4	带有一个通过电子断开获得断开位置的开关的器具或者带有处于待机状态开关的器具, 要进行 19.11.4.1—19.11.4.7 的试验		N
19.11.4.1	对每一个预先选定的点进行 10 次正极的放电和 10 次负极的放电试验		N
19.11.4.2	器具在辐射区进行试验, 3 级测试适用		N
19.11.4.3	器具进行瞬时脉冲试验		N
19.11.4.4	器具电源接线端子进行电压浪涌试验		N
19.11.4.5	器具按 GB/T 17626.6 注入电流, 3 极测试标准适用		N
19.11.4.6	器具依据 GB/T 17626.11 进行电压暂降与短时中断的试验		N
19.11.4.7	器具应经受电源信号试验, 2 级测试水平适用		N
19.12	如果对 19.11.2 中规定的某一故障情况, 器具的安全都取决于一个符合 GB 9364.1 的微型熔断器的动作, 则用一个电流表替换微型熔断器, 重复该试验, 测量通过微型熔断器的电流。微型熔断器的额定电流; 实测电流		N
19.13	试验期间, 器具不应喷射出火焰、熔融金属、达到危险量的有毒性或可燃的气体		P
	温升不应超过表 9 中的值		P
	外壳变形不能达到不符合第 8 章的程度		N
	若器具还能工作, 应符合 20.2 的规定		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	非 III 类器具的绝缘应承受 16.3 的电气强度试验。试验电压按表 4 规定设定:		N
	—— 对基本绝缘.....:1250V		N
	—— 对附加绝缘.....:1750V		N
	—— 对加强绝缘.....:3000V		N
	如器具仍然是可运行的, 器具不用经历过危险性功能失效		N
	且保护电子电路不得失效		N
	器具在电子开关断开或待机模式下按要求试验时, 器具不应运行		N

20	稳定性和机械危险		N
20.1	器具应有足够的稳定性		N
	倾斜试验, 倾斜角度 10° (器具放置的斜面与水平面间的夹角), 器具不应翻倒		N
	带电热元件的器具重复倾斜试验, 倾斜角度增大至 15°		N
	在每个翻倒的位置进行发热试验, 温升不应超过表 9 值		N
20.2	活动部件应适当安置或封盖, 以提供防止人身伤害的保护		N
	保护性外壳、防护罩和类似部件应是不可拆卸的		N
	应具有足够的机械强度并牢固固定防护外壳		N
	自复位热断路器和过流保护装置在意外再次接通时不应引起危险	无此类零部件	N

21	机械强度		N
21.1	器具有足够的机械强度, 其结构应经受正常使用中可能出现的野蛮搬运	III类器具	N
	对器具外壳各部分以 0.5J 的冲击能量打击三次后, 应无损坏		N
	必要时, 加强绝缘或附加绝缘要经受 16.3 的电气强度试验		N

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条款	标准要求	试验结果	判定
	必要时, 在新样品的同一部位反复打击, 三次为一组		N
21.2	固体绝缘的易触及部件, 应有足够的强度防止锋利工具的刺穿		N
	按要求对绝缘进行试验, 除非		N
	附加绝缘厚度不小于 1mm, 加强绝缘厚度不少于 2mm		N

22	结构		P
22.1	器具标有 IP 代码的第一特征数字, 则应满足 GB 4208 (eqv IEC60529) 的有关要求		N
22.2	对驻立式器具, 应提供一种确保与电源全极断开的措施, 如下所述:	非驻立式	N
	—— 一条带插头的电源软线		N
	—— 一个符合 24.3 的开关		N
	—— 说明书中指出, 在固定布线中提供一种断开装置		N
	—— 一个器具输入插孔		N
	对于打算与固定布线做永久连接的单相 I 类器具, 若装有一个单相开关或用来将电热元件从电源上断开的单极保护装置, 则应与相线相连		N
22.3	带有插脚的器具, 不对插座施加过量的应力		N
	施加力矩不超过 0.25Nm		N
	将器具从烘箱中取出后, 立即对每只插脚施加 50N 的拉力 1min, 冷却至室温后插脚的位移不得超过 1mm		N
	再对每只插脚施加 0.4Nm 的转矩, 插脚不应旋转, 除非其旋转不妨碍器具符合本标准		N
22.4	用于加热液体的器具和引起过度振动的器具不应提供直接插入输出插座用的插脚		N
22.5	在触及插头的插脚时, 应无电击危险		N
22.6	电气绝缘应不受冷凝水或泄漏液体的影响		N
	软管断裂或密封泄漏, 不应影响 II 类器具和 II 类结构的电气绝缘		N

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22.7	带有蒸汽发生装置的器具, 应对过压危险有足够防护措施		N
22.8	若隔间不借助工具便可触及, 并且在正常使用中可能被清洗, 则在清洗的过程中电气连接不应受到拉力		N
22.9	绝缘、内部布线、绕组、整流子和滑环之类的部件不暴露于油、油脂或类似物质		N
	有绝缘暴露于其中的油或油脂应具有足够的绝缘性能		N
22.10	应不可能通过器具内自动开关装置动作来复位电压保持型非自复位热断路器	无此类部件	N
	非自复位电机热保护器应具有自动脱扣功能, 除非它们是电压保持型		N
	非自复位控制器的复位钮, 如果其意外复位能引起危险则应放置或防护使其不可能发生意外复位		N
22.11	对电击、水或防止与运动部件的接触提供必要防护的不可拆卸部件应可靠固定		P
	用于固定这类零件的钩扣搭锁应有一个明显的锁定位置		N
	在安装或保养期间可能被取下的零件上使用的钩扣搭锁装置, 其固定性能不应劣化		N
	试验		N
22.12	手柄、旋钮等以可靠的方式固定		N
	用于指示开关和类似元件档位的手柄、旋钮等应不可能固定在错误的位置上		N
	对使用中不可能受到轴向力的部件施加 15N 的力测试, 1min		N
	对使用中可能受到轴向力的部件施加 30N 的力测试, 1min		N
22.13	在正常使用中握持手柄时, 操作者的手应不可能触及温升超过规定值的部件		N
22.14	不应有在正常使用或用户维护期间对用户造成危险的粗糙或锐利的棱边		N
	不应有在正常使用期间或用户维护期间, 用户易触及的暴露在外的自攻螺钉等的尖端		N

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22.15	柔性软线的贮线钩或类似物应平整圆滑		N
22.16	自动卷线器应不引起柔性软线护套的过分刮伤或损坏、导线断股、接触处的过度磨损		N
	卷线器按规定进行 6000 次操作试验		N
	16.3 的电气强度试验, 试验电压为 1000V		N
22.17	定距件应不可能从器具外面用手、螺丝刀或扳手拆除		N
22.18	载流部件和其它金属部件应能耐受正常使用情况下的腐蚀		P
22.19	传动皮带不能用作电气绝缘		N
22.20	应有效防止带电部件与热绝缘的直接接触, 除非这种材料是不腐蚀、不吸潮并且不燃烧的		N
	通过视检, 必要时通过试验, 检查其合格性		N
22.21	木材、棉花、丝、普通纸及类似的纤维或吸湿材料, 除非经过浸渍处理, 否则不能作为绝缘使用	无此类材料使用	P
22.22	石棉不应在器具的结构中使用	无此类材料使用	P
22.23	不应使用含有多氯联苯的油类 (PCB)	无此类材料使用	P
22.24	裸露的电热元件应得到充分的支撑	无此类电热元件	N
	即使断裂, 电热导线也不可能与接地金属部件或易触及金属部件接触		N
22.25	下垂的电热导线不能与易触及的金属部件接触		N
22.26	安全特低电压下工作的部件与其它带电部件之间的绝缘, 应符合双重绝缘或加强绝缘的要求		N
22.27	用保护阻抗连接的部件之间, 应采用双重绝缘或加强绝缘隔开		N
22.28	II 类器具中与煤气管道有导电性连接或与水接触的金属部件, 应用双重绝缘或加强绝缘与带电部件隔开		N
22.29	永久连接到固定线路的 II 类电器, 其结构应能使所要求的防电击保护等级在安装后仍能保持		N
22.30	用作附加绝缘或加强绝缘的部件应可靠固定, 使之不受严重损坏就不能被拆下, 或		N
	其结构应使它们不能被更换到一个错误位置上, 而且若被遗漏, 则器具便不能工作或明显不完整		N

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22.31	附加绝缘或加强绝缘上的电气间隙和爬电距离不得因磨损而低于 29 章的规定值		N
	导线、螺钉、螺母或弹簧等类似零件的松动或脱落不应使带电部件与易触及部件之间的电气间隙和爬电距离低于对附加绝缘的规定值		N
22.32	附加绝缘或加强绝缘的设计或保护应能防止尘埃或脏物的沉积		N
	作为附加绝缘的天然或合成橡胶材料的部件应是耐老化的, 或其设置和尺寸不应使爬电距离低于 29.2 中规定值		N
	未紧密烧结的陶瓷材料、类似材料或单独的绝缘串珠不得用作附加绝缘或加强绝缘		N
	氧气罐试验: 70℃中保持 96h, 室温放置 16h		N
22.33	在正常使用中易触及的或可能成为易触及的导电性液体, 不应与带电部件直接接触		N
	电极不能用于加热液体		N
	对 II 类结构, 在正常使用中易触及的或可能变为易触及的导电液体不应与基本绝缘或加强绝缘直接接触		N
	对 II 类结构, 若导电液体与带电部件接触, 则不应与加强绝缘直接接触		N
22.34	操作旋钮、手柄、操作杆和类似部件的轴不应带电, 除非该部件上的零件取下后, 轴是不易触及的		N
22.35	在正常使用中握持或操纵手柄、操纵杆和旋钮, 即使绝缘失效也不应带电		N
	此类部件若用金属制成, 且它们的轴或固定装置在绝缘失效时可能带电, 则它们应用绝缘材料充分覆盖, 或用附加绝缘将其易触及部分与它们的轴或固定装置隔开		N
	对驻立式器具, 非电气元件的手柄、操纵杆和旋钮, 只要与接地端子或接地触点可靠连接, 或用接地金属将其与带电部件隔开, 则本要求不适用		N
22.36	在正常使用中用手连续握持的手柄, 其结构应使操作者的手在按正常使用抓握时, 不可能与金属部件接触, 除非这些金属部件是用双重绝缘或加强绝缘与带电部件隔开		N

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条款	标准要求	试验结果	判定
22.37	对 II 类器具, 电容器不应与易触及的金属部件连接, 符合 22.42 条的除外		N
	II 类器具的电容器金属外壳应采用附加绝缘将其与易触及金属部件隔开, 符合 22.42 条的除外		N
22.38	电容器不应连接在一个热断路器的触头之间		N
22.39	灯座只能用于连接灯头	无此类部件	N
22.40	打算在工作时移动或有易触及运动部件的电动器具和联合型器具, 应装有一个控制电动机的开关。开关的动作构件应明显可见且易操作	非此类器具	N
22.41	除灯头外, 器具不应有含汞的元件	无此类部件	N
22.42	由至少二个单独元件构成的保护阻抗		N
	这些元件中的任何一个出现短路或开路, 都不应超过 8.1.4 中规定值		N
22.43	能调节适用不同电压的器具, 其结构应使调定位置不可能发生意外的变动		N
22.44	器具外壳的形状或装饰不应使器具容易被孩子当成玩具		P
22.45	当空气被用作加强绝缘, 应保证器具的外壳在外力作用下发生变形时, 电气间隙不低于 29.1.3 的规定值		N
22.46	在保护电子电路中使用的软件, 应为 B 级或 C 级软件		N
22.47	打算连接到水源的器具应能承受正常使用的中的水压		N
22.48	打算连接到水源的器具, 起结构应能防止倒虹吸现象导致非饮用水进入水源		N

23	内部布线		N
23.1	布线槽应平滑无锐边	III 类器具	N
	布线的保护不应与毛刺及散热片接触		N
	金属导线孔应平整圆滑或带有衬套		N
	应有效防止布线与运动部件接触		N
23.2	带电导线上的串珠和类似的陶瓷绝缘件应可靠固定, 不能改变其位置或放置在锐边上	无此类部件	N

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	柔性金属管内的绝缘串珠应装在绝缘套内		N
23.3	彼此间有相对运动的电气连接和内部导线不应受到过分的应力	无此类结构	N
	柔性金属管不应引起导线绝缘的损坏		N
	不应使用开式盘簧		N
	簧圈相互接触的盘簧, 其内应加上足够的绝缘衬层		N
	正常使用中会弯曲的导线 10,000 次弯曲试验后无损坏; 仅在用户维护时会弯曲的导线 100 次弯曲试验后无损坏		N
	带电部件与金属部件间应经受 1000V 的电气强度试验		N
23.4	裸露内部布线应是刚性的并被固定	无此类结构	N
23.5	内部布线的绝缘应能经受正常使用中可能出现的电气应力		N
	在导线和包裹在绝缘层外面的金属箔之间施加 2000V 电压, 持续 15min, 不应击穿		N
23.6	用作内部布线的附加绝缘的套管, 应采用可靠的方式保持在位		N
23.7	黄/绿双色线只用于接地导线		N
23.8	铝线不能用作内部布线		N
23.9	多股绞线在承受压力处不应使用铅-锡焊将其焊在一起, 除非		N
	夹紧装置的结构使得此处不会由于焊剂的冷流变而产生不良接触的危险		N
23.10	器具连接水源用外部软管中内部导线的绝缘和护套至少应与轻型聚氯乙烯护套软线相当		N
24	元件(本章未获 CNAS 认可)		N
24.1	元件应符合相应 IEC 标准中规定的安全要求		N
	元件清单		N
	若元件未经检测并被认定符合 IEC 标准关于循环次数的要求, 应根据 24.1.1 到 24.1.6 的规定对元件进行试验		N

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24.1.1	可能永久承受电源电压, 并且用于无线电干扰抑制或电压分离的电容器应符合 IEC 60384-14, 或者		N
	根据附录 F 进行试验		N
24.1.2	安全隔离变压器应符合 IEC 61558-2-6, 或者		N
	根据附录 G 进行试验		N
24.1.3	开关应符合 IEC 61058-1, 工作循环至少为 10000 次, 或者		N
	根据附录 H 进行试验		N
	如果该开关控制继电器或电流接触器, 则整个开关系统经受试验		N
24.1.4	自动控制器应符合 IEC 60730-1 和相应的第 2 部分标准。工作循环的次数为:		N
	—温控器 10000		N
	—限温器 1000		N
	—自复位热断路器 300		N
	—非自复位热断路器 30		N
	—定时器 3000		N
	—能量调节器 10000		N
	—电压保持型非自复位热断路器 1000		N
	—其它非自复位热断路器 30		N
	电动机热保护器与电动机一起按附录 D 进行试验		N
	连接水源的外部软管组件中的电动水阀如果含有带电部件, 其外壳防水等级应符合 IEC 60730-2-8 中 6.5.2 的 IPX7 要求		N
24.1.5	器具耦合器应符合 GB 17465.1		N
	但是, 对于防水等级高于 IPX0 的器具, 器具耦合器应符合 60320-2-3		N
	互连耦合器的相关标准是 GB 17465.2		N
24.1.6	类似于 E10 灯座的小型灯座应符合 GB 17935 中对于 E10 灯座的规定		N
24.2	不应装有在柔性软线上的开关或自动控制器		N
	不应装有当器具出现故障, 引起固定布线中保护装置动作的装置		N

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条款	标准要求	试验结果	判定
	不应装有靠钎焊复位的热断路器		N
24.3	用于驻立式器具全极断开的开关, 应直接连接到电源接线端子, 并且所有极上的触点开距在 III 类过电压类别条件下提供全断开		N
24.4	电热元件和特低电压电路用的插头和插座, 不能与 IEC 60083 或 IEC 60906-1 所列的插头和插座或符合 GB 17465.1 的连接器和器具输入插口互换		N
24.5	电动机辅助绕组中的电容器应标出额定电压和额定电容量, 并按照标示使用		N
	对于与电动机绕组串联的电容器, 当器具在最小负载下, 以 1.1 倍额定电压供电时, 电容器的端电压不应超过其额定电压的 1.1 倍		N
24.6	若电动机与电网电源连接, 并且其基本绝缘对于器具的额定电压来说不够充分, 则其工作电压不应超过 42V		N
	此类电动机应符合附录 I		N
24.7	器具连接到水源的软管组件应符合 IEC 61770 的要求, 它们应与器具一同交付		N

25	电源连接和外部软线		N
25.1	不打算永久性连接到固定布线的器具, 应具有下述电源连接装置之一:	III 类器具	N
	—— 一条带插头的电源软线		N
	—— 至少与器具要求的防水等级相同的器具输入插口		N
	—— 用于插入输出插座的插脚		N
25.2	器具不应装有多于一个的电源连接装置		N
	用于多种电源的驻立式器具可以装有一个以上的电源连接装置, 只要各连接装置间能承受 1250V, 1min 的电气强度试验, 不被击穿		N
25.3	永久连接到固定布线的器具, 允许在器具被安装到支架后, 再进行电源线连接, 并提供下述连接装置之一:		N
	—— 连接标称截面积符合 26.6 规定的固定布线电缆的一组接线端子		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	—— 连接柔性软线的一组接线端子		N
	—— 容纳在适合的隔间内的一组电源引线		N
	—— 连接适当类型的软缆或导管的一组接线端子和软缆入口、导管入口、预留的现场成形孔或压盖		N
25.4	对于打算连接到固定布线且额定电流不超过 16A 的器具, 其导管或软缆入口应能容纳总直径为表 10 中规定值的导管或软缆		N
	导管或软缆的入口不会影响对电击的防护, 或使电气间隙和爬电距离减小到低于 29 章的规定值		N
25.5	电源软线安装到器具的方法:		N
	—— X 型连接		N
	—— Y 型连接		N
	—— Z 型连接		N
	X 型连接不应用于扁平双芯金属箔线的连接, 除非		N
	为专门制备的软线		N
25.6	插头只应装有一根柔性软线		N
25.7	电源软线不应轻于以下规格:		N
	—— 编织的软线 (IEC60245 的 51 号线)		N
	—— 普通硬橡胶护套的软线 (IEC60245 的 53 号线)		N
	—— 普通氯丁橡胶护套的软线 (IEC60245 的 57 号线)		N
	—— 扁平双芯金属箔软线 (IEC60227 的 41 号线)		N
	—— 质量不超过 3kg 的器具, 轻型聚氯乙烯护套软线 (IEC60227 的 52 号线)		N
	—— 质量超过 3kg 的器具, 普通聚氯乙烯护套软线 (IEC60227 的 53 号线)		N
	若器具的外部金属件温升超过 75K, 则不能使用 PVC 导线作电源软线, 除非		N
	—— 器具的结构使得电源软线在正常使用中不可能触及上述外部金属部件, 或		N
	—— PVC 线耐高温, 此时应使用 Y 型连接或 Z 型连接		N

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GB 4706.1			
条款	标准要求	试验结果	判定
25.8	电源线的标称横截面积不应小于表 11 的规定值; 器具的额定电流(A); 标称横截面积(mm²):		N
25.9	电源线不应与尖点或锐边接触		N
25.10	I 类器具的电源线中应有一根绿/黄双色线用作接地线		N
25.11	电源软线的导线在承受接触压力处不应使用铅锡焊将其合股加固, 除非		N
	夹紧装置的结构使其不因焊剂的冷变形而存在不良接触的危险		N
25.12	将软线模制到外壳上时, 该电源软缆或软线的绝缘不应被损坏		N
25.13	软线入口衬套的形状能防止电源软线损坏		N
	除非软线入口处的外壳是绝缘材料, 否则应有不可拆卸的衬套或护套以提供符合 29.3 的附加绝缘		N
	如果供电软线无套管, 应有类似的附加衬套或套管, 除非		N
	器具属于 0 类		N
25.14	电源软线应具有防止过度弯曲的足够保护		N
	弯曲试验; 施加的力; 弯曲次数		N
	该试验不应导致:		N
	—— 导线之间短路		N
	—— 任何导线的绞线丝断裂超过 10%		N
	—— 导线从接线端子上脱离		N
	—— 导线保护装置松脱		N
	—— 软线或软线保护装置在本标准意义内的损坏		N
25.15	通过软线固定装置, 使电源软线的导线免受拉力和扭矩, 并保护导线的绝缘免受磨损、		N
	应不可能将软线推入器具, 使软线或器具内部部件损坏		N
	电源软线的拉力和扭矩试验, 按表 12 的示值: 拉力(N); 扭矩(非自动卷线器)(Nm):		N
	软线不应损坏, 在各接线端子处不应有明显张力。再次施加拉力时, 软线的最大位移不应超过 2mm。		N

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条款	标准要求	试验结果	判定
	爬电距离和电气间隙不减少到低于 29.1 的规定值		N
25.16	对于 X 型连接的软线固定装置, 其结构和位置应使:		N
	—— 软线的更换方便可行		N
	—— 能清楚地表明如何免除张力和防扭绞		N
	—— 适合于不同类型的软线		N
	—— 若软线固定装置的夹紧螺钉是易触及的, 则软线不能触及这些螺钉, 除非		N
	螺钉与易触及的金属部件被附加绝缘隔开		N
	—— 不用直接压在软线上的金属螺钉固定软线		N
	—— 至少软线固定装置的一部分被可靠地固定在器具上, 除非固定装置是特制软线的一部分		N
	—— 如果适用, 则在更换软线时必须被操作的螺钉, 不能用来固定其他元件		N
	—— 若迷宫式装置有可能被旁路, 则仍要经受 25.15 试验		N
	—— 对 0 类、0 I 类和 I 类器具: 除非软线绝缘的失效不会使易触及金属部件带电, 否则软线固定装置应由绝缘材料制造, 或带有绝缘衬层		N
	—— 对 II 类器具: 软线固定装置应由绝缘材料制造, 或若是金属, 则要用附加绝缘将其与易触及金属部件隔开		N
25.17	用于 Y 型和 Z 型连接的软线固定装置应胜任其功能		N
25.18	软线固定装置只有借助工具才能触及		N
	或其结构使得软线只能借助工具才能装上		N
25.19	对 X 型连接, 压盖不应作为便携式器具的软线固定装置		N
	不允许将软线打成一个结或使用绳子将软线拴住		N
25.20	对 Y 型和 Z 型连接的电源软线应具有足够的补充绝缘		N
25.21	对于为 X 型连接的电源软线或固定布线的连接提供的隔间, 其结构应保证:		N
	—— 在装罩盖之前能检查导线是否在正确的位置且正确的连接		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	—— 连接时无损坏导线及其绝缘的危险		N
	—— 对便携式器具, 如果导线有可能从端子上滑出, 应防止导线无绝缘的端头与易触及金属部件的接触		N
25.22	器具输入插口:		N
	—— 在插入或拔出时, 带电部件均不易触及		N
	—— 连接器便于插入		N
	—— 连接器不应支撑器具		N
	—— 若外部金属部件的温升超过 75K, 则不应使用适于冷环境的输入插口, 除非电源线不可能接触此类金属部件		N
25.23	互连软线应符合电源软线的要求, 下列情况除外:		N
	—— 互连软线的截面积由 11 章试验期间导线承载的最大电流决定, 而不是由器具的额定电流决定		N
	—— 若导线承受的电压小于器具的额定电压, 则导线绝缘层的厚度可适当减少		N
	必要时进行 16.3 的电气强度试验		N
25.24	若互连软线的断开会妨碍器具符合本标准, 则不借助工具应无法拆下互连软线		N
25.25	器具插脚的尺寸应与相应的插座匹配。插脚和啮合面的尺寸应与 IEC 60083 中相应插头的尺寸一致		N

26	外部导线用接线端子		N
26.1	器具应具有连接外部导线的接线端子或等效装置		N
	仅在取下不可拆卸的盖子后才能触及该接线端子		N
	如果接地端子需要工具进行连接并提供独立于导线连接的加紧装置, 则它可以是易触及的		N
26.2	X 型连接的器具和连接到固定布线的器具, 应提供用螺钉、螺母或等效装置进行连接的接线端子, 除非使用焊接		N
	螺钉和螺母仅用于夹紧电源导线, 除了		N
	如果内部导线的布置使其在装配电源导线时不可能被替换, 则螺钉和螺母也可同时用于加紧内部导线		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	如果通过钎焊连接, 导线定位或固定的可靠性不得单一地依赖于焊接		N
	如果有挡板, 即使导线从焊点脱开, 爬电距离和电气间隙仍能满足规定, 则可单一使用焊接		N
26.3	X 型连接的和连接到固定布线的接线端子, 应有足够的接触压力将导线夹持在金属表面之间, 并且不损伤导线		N
	此类接线端子应被固定得使其在夹紧装置被拧松或拧紧时:		N
	—— 接线端子不松动		N
	—— 内部布线不受到应力		N
	—— 爬电距离和电气间隙不得减少到低于 29 章的规定值		N
	视检并按 IEC60999-1 中 9.6 试验, 所施加的力矩等于规定力矩的 2/3, 螺纹标准直径 (mm); 螺纹种类; 力矩 (Nm)		N
26.4	除具有专门制备软线的 X 型连接的接线端子外, 其余 X 型连接的接线端子和连接固定布线的接线端子应不要求导线专门制备, 其结构或放置应防止导线在紧固时滑出		N
26.5	X 型连接的接线端子, 其位置和防护应保证: 在装配导线时, 若多股绞线的一根线丝滑出, 带电部件和易触及金属部件之间不存在意外连接的危险		N
	将导线端部的绝缘去除 8mm 后, 进行试验		N
	在带电部件与易触及金属部件之间, 以及对 II 类结构, 在带电部件和仅用附加绝缘体与易触及金属部件隔离的金属部件之间, 不存在意外连接的危险		N
26.6	X 型连接和连接到固定布线的接线端子, 应适于连接标称横截面积如表 13 所列的导线。额定电流 (A); 标称截面积 (mm ²)		N
	仅适用于连接专门制备的软线的接线端子		N
26.7	X 型连接的接线端子, 在罩盖或外壳的一部分被取下后, 应是易触及的		N
26.8	连接固定布线的接线端子, 包括接地端子, 应彼此靠近		N
26.9	柱形接线端子的结构和设置应符合规定要求		N

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GB 4706.1			
条款	标准要求	试验结果	判定
26.10	螺钉夹紧的接线端子和无螺钉的接线端子, 不应用于连接扁平双芯箔线, 除非导线端部装有适合的连接装置		N
	对连接施加 5N 的拉力进行试验		N
26.11	Y 型和 Z 型连接可以使用钎焊、熔焊、压接和类似的连接方法		N
	对 II 类器具, 导线定位或固定不得单一地依赖于钎焊、熔焊和压接		N
	对 II 类器具, 如果有挡板, 即使导线从连接处脱开, 爬电距离和电气间隙仍能满足规定, 则可单一使用锡焊、熔焊和压接		N

27	接地措施		N
	0I 类和 I 类器具的易触及金属部件, 永久可靠地连接到一个接地端或输入插孔的接地触点上		N
	接地端不应与中性接线端子连接		N
	0 类、II 类和 III 类器具不应有接地措施		N
	安全特低电压电路不应接地, 除非是保护性特低电压电路		N
27.2	接地端子的夹紧装置应可靠牢固, 以防意外松动		N
	连接外部等电位导线的接线端子, 应允许连接标称截面为 2.5mm ² 至 6mm ² 的导线		N
	该端子不应用于为器具的不同部件提供接地连续性		N
	不借助工具不能松开导线		N
27.3	带接地连接的可拆卸部件插入到器具的另一部分中, 其接地连接应在载流连接之前完成; 在拔出部件时, 接地连接在载流连接断开之后断开		N
	对带有电源线的器具, 如果软线从固定装置中滑出, 载流导线应比接地导线先绷紧		N
27.4	接地端子的金属与其它金属间的接触不应引起腐蚀危险		N
	除金属框架或外壳外, 用于提供接地连续性的部件都应充分防腐蚀		N
	提供接地连续性的钢制件, 其基本表面应有厚度至少为 5 μm 的电镀层		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	仅用于提供和传递接触压力的带涂层或不带涂层的钢制件应充分防锈		N
	应采取预防措施避免铝合金引起的腐蚀危险		N
27.5	接地端子或触点与接地金属部件之间的连接应是低电阻的		N
	如果对于保护性特低电压电路, 基本绝缘的电气间隙取决于器具的额定电压, 则本要求不适用		N
	在规定的低电阻试验中, 电阻值应不超过 0.1Ω		N
27.6	印刷电路板上的印刷导体在手持式器具中不能用于提供接地连续性		N
	该导体可用在其它器具中, 如果		N
	—— 至少有两条电路使用彼此独立的焊点, 且对于每一电路, 器具都符合 27.5 的规定		N
	—— 印刷电路板材料符合 IEC 60249-2-4 或 IEC 60249-2-5		N

28	螺钉和连接		N
28.1	紧固装置、电气连接以及提供接地连续性的连接应能承受机械应力		N
	螺钉不应使用柔软的或易蠕变的金属(如锌和铝)制造		N
	若螺钉为绝缘材料, 则标称直径最小为 3mm		N
	绝缘材料螺钉不得用于任何电气连接或提供接地连续性		N
	用于电气连接或提供接地连续性的螺钉应旋入金属		N
	若用金属螺钉替换会损害附加绝缘和加强绝缘, 则该螺钉不能用绝缘材料制造		N
	螺钉和螺母, 按规定承受扭矩试验, 施加表 14 所示的力矩(Nm)		N
28.2	接触压力不应通过那些易于收缩或变形的绝缘材料来传递, 除非能补偿收缩或变形		N
	本要求不适用于电流不超过 0.5A 的电气连接		N
28.3	如果能将零件夹在一起, 宽螺距(金属板)螺钉可用于电气连接		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	自攻螺钉不能用于电气连接, 除非能加工出一种符合完全标准形状的机械螺钉螺纹		N
	如果这种螺钉可能由用户或安装人员拆装, 则不应使用自攻螺钉, 除非螺纹是挤压成形的		N
	如果不妨碍连接并且每一处连接至少有两个螺钉, 宽螺距螺钉或自攻螺钉可用于提供接地连续性的连接		N
28.4	用于机械连接的螺钉和螺母, 若同时用于电器连接或提供接地连续性, 应可靠固定防止松动		N
	用于电气连接或提供接地连续性的铆钉, 若承受扭力, 应可靠固定防止松动		N

29	电气间隙、爬电距离和固体绝缘		N
	电气间隙、爬电距离和固体绝缘应足以承受器具可能经受的电气应力	III 类器具	N
	如果在印刷电路板上涂层被用于保护微环境或提供基本绝缘, 则附录 J 适用		N
	使用 A 类涂层, 微观环境为 1 级污染沉积		N
	使用 B 类涂层, 则对电气间隙和爬电距离不做要求		N
29.1	考虑到表 15 中过压类别对应的额定脉冲电压, 电气间隙应不小于表 16 中的规定值, 除非		N
	基本绝缘与功能绝缘满足第 14 章的脉冲电压试验要求		N
	如果器具结构使得距离受磨损、变形、部件运动或装配影响时, 额定脉冲电压为 1500V 或以上电压时, 电气间隙应增加 0.5mm, 并且脉冲电压试验不适用		N
	在以下情况, 脉冲电压试验不适用		N
	—— 微观环境为 3 级污染沉积		N
	—— 在 0 类和 0I 类器具的基本绝缘上		N
	器具属于 II 类过压类别		N
	通过视检和测量检查其合格性		N
29.1.1	考虑到额定脉冲电压, 基本绝缘的电气间隙应承受正常使用中出现的过压		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	若微环境的污染等级为 1 级, 对于管状铠装电热元件的接线端子, 电气间隙可以减小到 1mm		N
	将绕组的漆包线视为裸露导线		N
29.1.2	附加绝缘的电气间隙不小于表 16 中对基本绝缘电气间隙的规定值		N
29.1.3	加强绝缘的电气间隙不小于表 16 中对基本绝缘电气间隙的规定值, 但应以比实际高一等级的额定脉冲电压为基准		N
29.1.4	对于功能性绝缘, 表 16 中的规定值适用, 除了		N
	在功能性绝缘被短路的情况下, 器具仍符合 19 章的要求		N
	将绕组的漆包线视为裸露导线		N
	不测量漆包线交叉点的电气间隙		N
	PTC 加热元件表面间的电气间隙可以减小到 1mm		N
29.1.5	对于工作电压高于额定电压的器具, 用于在表 16 中确定电气间隙的电压应是额定脉冲电压加上工作电压的峰值与额定电压峰值之差		N
	如果降压变压器的副绕组接地, 或者在主绕组和副绕组之间有接地的屏蔽, 副绕组侧的电气间隙应不小于表 16 中的规定值, 但是应以比实际低一等级的额定脉冲电压为基准		N
	如果电路的供电电压低于额定电压, 则功能性绝缘的电气间隙应以工作电压为基准, 在表 15 中该电压被视为额定电压		N
29.2	爬电距离应不小于工作电压相应的值, 并考虑材料的类别和污染等级		N
	污染等级为 2 级, 除非		N
	—— 采取预防措施保护绝缘, 此时污染等级为 1 级		N
	—— 绝缘经受导电性污染, 此时污染等级为 3 级		N
	通过测量检查其合格性		N
29.2.1	基本绝缘的爬电距离应不小于表 17 的规定值		N
	除 1 级污染外, 如果已采用 14 章的试验检查某一特殊的电气间隙, 则相应的爬电距离应不小于表 16 中电气间隙的最小值		N

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GB 4706.1			
条款	标准要求	试验结果	判定
29.2.2	附加绝缘的爬电距离应不小于表 17 的规定值		N
29.2.3	加强绝缘的爬电距离应不小于表 17 的规定值的两倍		N
29.2.4	功能性绝缘的爬电距离应不小于表 18 的规定值		N
	如果在功能性绝缘被短路的情况下, 器具仍符合 19 章的要求, 则功能性绝缘的爬电距离可减小		N
29.3	附加绝缘与加强绝缘应有足够厚度或层数, 以经受器具在使用中可能出现的电气应力		N
	通过下述试验确定:		N
	—— 依据 29.3.1 测量方法, 或		N
	—— 依据 29.3.2 进行电气强度试验, 或		N
	—— 依据 29.3.3, 结合电气强度试验来评估材料的热性能		N
29.3.1	若用作附加绝缘, 绝缘的最小厚度为 1mm		N
	若用作加强绝缘, 绝缘的最小厚度为 2mm		N
29.3.2	每一层材料都应进行 16.3 针对附加绝缘的电气强度试验		N
	附加绝缘至少由两层构成		N
	加强绝缘至少由三层构成		N
29.3.3	依据 GB/T 2423.2 的 Bb 试验进行 48h 干热试验, 并按规定进行电气强度试验。		N
	在 19 章试验中所测温升不超过表 3 规定值, 不进行 GB/T 2423.2 的试验		N

30	耐热和耐燃		N
30.1	下列部件均应充分耐热		N
	—— 非金属材料制成的外部零件		N
	—— 支撑带电部件的零件		N
	—— 提供附加绝缘或加强绝缘的热塑材料		N
	根据 IEC 60695-10-2 进行球压试验		N
	对外部零件, 75℃或 40℃加 11 章试验期间的最大温升两者中取大值, 试验温度(℃)		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	对支撑带电部件的零件, 125℃或 40℃加 11 章试验期间的最大温升两者中取大值, 试验温度(℃)		N
	对提供附加绝缘或加强绝缘的热塑性材料零件, 25℃加 19 章试验期间的最高温升, 如果该值更大, 试验温度(℃)		N
30.2	有关部件的非金属材料应耐燃和阻燃		N
30.2.1	以 550℃的温度进行 IEC 60695-2-11 的灼热丝试验, 除非		N
	根据 GB/T 5169.16, 材料的类别至少为 HB40		N
	不能进行灼热丝试验的部件应满足 ISO 9772 中对 HBF 类材料的要求		N
30.2.2	对有人照管下工作的器具, 支撑在载流连接件的绝缘材料部分, 以及这些连接件 3mm 距离内的绝缘材料部件, 经受 GB/T 5169.11 的灼热丝试验, 在如下条件下进行:		N
	对于正常工作期间其载流超过 0.5A 的连接件, 750℃		N
	其他连接件, 650℃		N
30.2.3	对无人照管下工作的器具, 按 30.2.3.1 和 30.2.3.2 进行试验		N
	在特定的情况, 不必进行该试验		N
30.2.3.1	支撑正常工作期间载流超过 0.2A 连接件的绝缘部件及距这些连接件 3mm 范围内的绝缘材料, 根据 GB/T 5169.12 其燃烧指数 (GWFI) 至少为 850℃		N
30.2.3.2	支撑载流连接件的部件和距这些连接件 3mm 范围内的部件应经受 GB/T 5169.11 规定的灼热丝试验, 但是		N
	根据 GB/T 5169.13, 材料起燃温度 (GWIT) 符合规定的部件不进行灼热丝试验, 即		N
	—— 775℃, 对正常工作期间载流超过 0.2A 的连接件		N
	—— 675℃, 对其它连接件		N
	根据 GB/T 5169.11, 灼热丝试验的温度		N
	—— 750℃, 对正常工作期间载流超过 0.2A 的连接件		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	—— 650℃, 对其它连接件		N
	在试验期间, 部件不产生火焰或产生火焰的时间不超过 2s。		N
	如果在试验期间, 火焰持续的时间超过 2s, 则连接件上方规定范围内的部件应经受附录 E 中的针焰试验, 除非		N
30.2.4	印刷电路板的基材应经受附录 E 中的针焰试验		N
	在特定的情况, 不必进行该试验		N

31	防锈		N
	有关的铁制零件应有足够的防锈能力		N

32	辐射、毒性和类似危险		N
	器具不应释放有害射线		N
	器具不应存在毒性或类似的危险		N

A	附录 A, (资料性附录) 例行试验		N
	附录表述了由制造商进行的例行试验		N

B	附录 B (规范性附录) 由充电电池供电的器具		N
	下述对标准的修改适用于通过充电电池供电的器具, 并且电池在器具中充电		N
	该附录不适用于电池充电器		N
3.1.9	器具在下列条件下运行:		N
	—— 器具由充满电的电池供电, 按照标准第二部分的规定运行		N
	—— 电池在充电之前应放电到无法使器具运行的程度		N
	—— 如有可能, 器具通过其充电器由电网供电, 在此之前, 电池应充分放电到无法使器具运行的程度		N
	—— 如果器具由两个可分离的部件组成, 应去除可拆卸部件, 并通过电网为器具供电		N

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GB 4706.1			
条款	标准要求	试验结果	判定
3.6.2	在废弃电池时需要拆除的部件不被认为是可拆卸部件		N
5.101	通过电网供电的器具应按照规定对电动器具的规定进行试验		N
7.1	打算由用户更换电池的情况下, 电池盒上应标有电池的电压和电极		N
7.12	打算由用户更换电池的器具应配备说明书以提供必要的信息		N
	若电池内含有对环境有危害的物质, 应提供如何拆除这类电池的说明		N
7.15	标志应在器具连接电源线的部件上		N
8.2	若器具的电池可由用户根据说明书更换, 则在带电部件与电池盒的内表面之间仅需基本绝缘		N
	若器具能在没有电池的情况下运行, 则在上述位置需要双重绝缘和加强绝缘		N
11.7	按照规定的时间对电池充电		N
19.1	器具应承受 19.101、19.102 和 19.103 的试验		N
19.101	以额定电压下为器具供电 168h, 同时对电池连续充电		N
19.102	对于不借助工具就可拆卸电池的器具, 将其充满电的电池短路		N
19.103	对于可由用户更换电池的器具, 拆除电池或者将电池摆放在任意说明书允许的位置, 使器具在额定电压下正常运行		N
21.101	带有插脚的器具应有足够的机械强度, 根据 IEC 68-2-32 中方法 2 进行检测		N
	器具上带有插脚的部件应经受 IEC 60068-2-32 中方法 2 规定的自由跌落试验, 跌落次数为:		N
	——100, 部件的重量不超过 250g		N
	——50, 部件的重量超过 250g		N
	试验后, 器具应满足 8.1, 15.1.1, 16.3 和第 29 章的要求		N
22.3	带插脚的器具应在尽可能完全装配的情况下经受试验		N

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GB 4706.1			
条款	标准要求	试验结果	判定
25.13	在安全特低电压下使用的互连软线不需要附加衬垫或衬套		N
30.2	对于在充电期间, 器具上连接电源线的部件, 30.2.3 适用		N
	对于其它部件, 30.2.2 适用		N

C	附录 C, (规范性附录) 在电动机上进行的老化试验		N
	对电动机绕组的绝缘温度分类有疑问时, 可进行该试验		N

D	附录 D, (规范性附录) 电动机热保护器		N
	适用于带有内置式热保护器的电动器具		N

E	附录 E, (规范性附录) 针焰试验		N
	按照 IEC 60695-2-2 进行针焰试验, 修改内容如下:		N
5	严酷等级		N
	试验中火焰的持续时间为 $30s \pm 1s$		N
8	试验程序		N
8.2	样品的安放应使火焰能施加在如图 1 所示的垂直或水平边缘		N
8.4	第一段不适用		N
	如有可能, 火焰施加的位置距角落至少 10mm		N
8.5	试验在一个样品上进行		N
	如果该样品不能经受该试验, 则可在另外的两个样品上重复试验, 但两个样品必须都能承受该试验		N
10	试验结果的评价		N
	燃烧持续时间不应超过 30s		N
	但对于印刷电路板, 燃烧持续的时间不应超过 15s		N

F	附录 F, (规范性附录) 电容器		N
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GB 4706.1			
条款	标准要求	试验结果	判定
	可能永久承受供电电压, 且用于射频干扰抑制或分压的电容器应符合 IEC 60384-14 的下列条款, 修改内容如下:		N
1.5	术语		N
1.5.3	X 型电容器按照 X2 型子类进行试验		N
1.5.4	该条款适用		N
1.6	标志		N
	a) 和 b) 项适用		N
3.4	认可试验		N
3.4.3.2	按照要求表 II 适用		N
4.1	视检和尺寸检查		N
	该条款适用		N
4.2	电气试验		N
4.2.1	该条款适用		N
4.2.5	该条款适用		N
4.2.5.2	只有表 IX 适用		N
	试验 A 的数据适用		N
	但对于电热器具的电容器, 试验 B 或 C 的数据适用		N
4.12	湿热, 稳定状态		N
	该条款适用		N
	只检查绝缘电阻和电压防护		N
4.13	脉冲电压		N
	该条款适用		N
4.14	耐久性		N
	4.14.1, 4.14.3, 4.14.4 和 4.14.7 适用		N
4.14.7	只检查绝缘电阻和电压防护		N
	视检, 无可见损伤		N
4.17	被动燃烧试验		N
	该条款适用		N
4.18	主动燃烧性试验		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	该条款适用		N

G	附录 G, (规范性附录) 安全隔离变压器		N
	下述对标准的修改适用于安全隔离变压器:		N
7	标志和说明		N
7.1	特殊用途的变压器应标明:		N
	——制造厂或责任承销商的名称、商标或识别标志		N
	——产品的型号或规格		N
17	变压器的过载保护和相关电路		N
	无危害式变压器应符合 IEC 61558-1 中 15.5 的规定		N
22	结构		N
	IEC 61558-2-6 中 19.1 和 19.1.2 适用		N
29	电气间隙, 爬电距离和固体绝缘		N
29.1, 29.2, 29.3	IEC 61558-1 表 13 中的 2a, 2c 和 3 适用		N

H	附录 H, (规范性附录) 开关		N
	开关应符合 IEC 61058-1 中下述条款, 修改内容如下:		N
	——在实际可能出现的情况下, 进行 IEC 61058-1 的试验		N
	——试验前, 使开关在无负载的情况下动作 20 次		N
8	标志和文件		N
	开关无需标志		N
	但是, 能脱离器具单独测试的开关应标有制造厂名称或商标和型号		N
13	机械装置		N
	对单独的样品进行试验		N
15	绝缘电阻和电气强度		N
15.1	该条款不适用		N

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GB 4706.1			
条款	标准要求	试验结果	判定
15.2	该条款不适用		N
15.3	适用于全断路和微断开		N
17	耐久性		N
	对三个独立的样品进行检测, 以判断其合格性		N
	在 17.2.4.4 中, 试验次数为 10000, 除非 IEC60335 第二部分的 24.1.3 条有不同的规定		N
	在空载下工作的开关、仅通过工具动作的开关和带有互锁装置以便在负载下不能动作的手动开关不必进行试验		N
	17.2.2 和 17.2.5.2 不适用。		N
	试验后, 接线端子的温升不应高于 IEC60335-1 第 11 章的试验中的温升超过 30K		N
20	电气间隙, 爬电距离, 固体绝缘和刚性印刷电路板组件的涂层		N
	该条款适用于功能性绝缘、全极断路和微小断路的电气间隙和爬电距离, 如表 24 所列		N

I	附录 I, (规范性附录)不适于器具额定电压的仅具有基本绝缘的电动机		N
	下列修改适用于不适于器具额定电压的仅具有基本绝缘的电动机		N
8	防止触及带电部件的保护		N
8.1	电动机的金属部件被认为是裸露的带电部件		N
11	发热		N
11.3	用电动机壳体的温升代替绕组的温升		N
11.8	在接触绝缘材料的部位, 电动机壳体的温升不应超过表 3 对相关绝缘材料的规定值		N
16	泄漏电流和电气强度		N
16.3	电动机的带电部件和其它金属部件之间不经受该试验		N
19	非正常工作		N
19.1	不进行 19.7 至 19.9 的试验		N

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GB 4706.1			
条款	标准要求	试验结果	判定
19.101	器具在额定电压下运行, 一次模拟下列一个故障条件:		N
	— N 电动机接线端子的短路, 包括电机电路中的任一电容的短路		N
	—— 整流器中每个二极管短路		N
	—— 电动机电源开路		N
	—— 电动机运行过程中, 任一并联电阻开路		N
	每次模拟一个故障条件, 试验连续进行		N
22	结构		N
22.101	对于 I 类器具, 若其电动机通过整流器电路供电, 则直流电路与器具的易触及部件之间应有双重绝缘或加强绝缘		N
	通过对双重绝缘和加强绝缘的试验检查其合格性		N

J	附录 J, (规范性附录) 涂覆印刷电路板		N
	对印刷电路板上保护性涂层的试验按 IEC 60664-3 进行, 修改如下:		N
6.6	气候顺序		N
	当使用批量生产的样品时, 对三个印刷电路板进行试验		N
6.6.1	冷态		N
	试验在 -25℃ 进行		N
6.6.3	温度的骤变		N
	规定严酷等级为 1 级		N
6.8.6	局部放电熄灭电压		N
	A 类涂层不经受局部放电试验		N
6.9	附加试验		N
	该条款不适用		N

K	附录 K, (规范性附录) 过电压类别		N
	过压类别的信息摘自 IEC60664-1		N
	过压类别是定义瞬间过压条件的一个数字		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	过压类别Ⅳ的设备为在初始安装地点使用的设备		N
	过压类别Ⅲ的设备为固定式设施中的设备, 在特定的情况下设备的可靠性和有效性应满足特殊的要求		N
	过压类别Ⅱ的设备是由固定式设施供电的耗能设备		N
	如果这类设备在可靠性和有效性方面满足特殊要求, 则属于过压类别Ⅲ		N
	过压类别Ⅰ的设备为连接电路中有必要的措施将瞬间过压限制在低水平的设备		N

L	附录 L, (资料性附录) 电气间隙和爬电距离的测量指南		N
	电气间隙和爬电距离的测量结果		N

M	附录 M, (规范性附录) 污染等级		N
	关于污染等级的信息摘自 IEC 60664-1		N
	考虑到宏观性, 微观环境决定了对绝缘的污染		N
	通过提供有效的外壳或类似的措施可以减少对绝缘的污染		N
	在微观环境存在污染的情况下, 最小电气间隙应符合规定		N
	为评定爬电距离, 对微观环境建立下列污染等级:		N
	——污染等级 1: 没有污染或仅有干燥的、非导电性的污染。污染不会产生影响		N
	——污染等级 2: 除了由于可预知的冷凝造成短时导电外, 仅存在非导电性污染		N
	——污染等级 3: 存在导电性污染或干燥的非导电性污染, 且后者会由于冷凝而导电		N
	——污染等级 4: 由于导电尘埃或雨雪造成的能持续导电的污染		N

N	附录 N, (规范性附录) 耐漏电起痕试验		N
	耐漏电起痕试验按 IEC60112 进行, 修改		N
7.3	试验溶液		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	使用溶液 A		N
10.1	程序		N
	规定的电压按其适用性分为 100V、175V、400V 或 600V		N
	第 3 章最后一段适用		N
	在 5 个样本上进行试验		N
	怀疑时, 如果材料经受住了比规定电压值少 25V, 滴数增加到 100 的试验, 则认为材料具有规定的 PTI 值		N
10.2	报告		N
	如果 PTI 值是在 100 滴溶液和 (PTI-25) V 电压下进行试验得到的, 则报告应对此说明		N

0	附录 0, (资料性附录) 第 30 章试验的选择和顺序		N
	耐热和耐燃试验的描述		N

P	附录 P, (资料性附录) 对于湿热气候中所用器具的标准应用导则		N
	本部分的如下修改内容适用于额定电压超过 150V、并且规定用于湿热气候的国家和地区的、标有 WDaE 标志的 0 类和 0I 类器具		N
	如果可能连接到由于固定布线的缺失而造成没有接地保护的电源的情况, 本部分也可适用于额定电压超过 150V、并且规定用于湿热气候的国家和地区的标有 WDaE 标志的 I 类器具		N
5	试验的一般条件		N
5.7	第 11 章和第 13 章的试验环境温度为 40+3°C		N
7	标志和说明		N
7.1	器具应有 WDaE 标志		N
7.12	说明书中应指出: 器具要配置一个额定剩余电流不超过 30mA 的剩余电流装置 (RCD)		N
	说明书应声明: 本器具适合在湿热气候的国家和地区中使用, 也可在其他国家和地区使用		N
11	发热		N

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GB 4706.1			
条款	标准要求	试验结果	判定
11.8	表 3 的值减小 15K		N
13	工作温度下的泄露电流和电气强度		N
13.2	I 类器具的泄露电流不应超过 0.5mA		N
15	耐潮湿		N
15.3	t 值为 37°C		N
16	泄露电流和电气强度		N
16.2	I 类器具的泄露电流不应超过 0.5mA		N
19	非正常工作		N
19.13	除进行 16.3 电气强度试验外, 还要进行 16.2 的泄露电流试验		N

Q	附录 Q, (资料性附录) 电子电路评估试验程序		N
	带电子电路器具的试验描述		N

R	附录 R, (规范性附录) 软件评估		N
	软件评估应按照 IEC 60730-1 附录 H 进行, 并作如下修改		N
H.2	定义		N
	仅 H.2.16 到 H.2.20 适用		N
H.7	信息		N
	仅表 7.2 中的脚注 12)~18) 适用		N
	脚注 15) 中用“GB 4706.1 的 19.13”代替“17、25、26 和 27 的要求”; 用“GB 4706.1 的 19.11.2”代替“H.27”		N
H.11.12	软件控制器		N
	除 H.11.12.6 和 H.11.12.6.1 不适用外, 所有 H.11.12 的内容作如下修改后适用		N
	在第二段中用“参照脚注 12)~18) 包括的内容”代替“66~72 包括的内容”		N
H.11.12.7	删去“以及表 7.2 中规定的, 要求 68”字样		N
H.11.12.7.1	用下述内容代替:		N

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GB 4706.1			
条款	标准要求	试验结果	判定
	对于使用带有自检和监控功能的单通道 C 级软件的器具, 制造商应提供必要的措施, 使得按表 H. 11. 12. 7-1 中给出的安全相关字段和数据来寻址故障/错误信息		N
H. 11. 12. 8	用下述内容代替		N
	故障/错误检测应在 GB 4706.1 的 19.13 的试验失败之前进行		N
H. 11. 12. 8.1	用“GB 4706.1 的 19.13 的试验失败之前进行”代替“结果参照表 7.2”		N
H. 11. 12. 8.1	用下述内容代替		N
	控制所有软件及与安全相关的硬件的初始化及终止应在 GB 4706.1 的 19.13 的试验失败之前进行		N

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10.1	表格: 输入功率偏差测量					P
测量部件	额定功率 (W)	实测功率 (W)	功率偏差 (%)	额定偏差 (%)	备注	
K-FRMF-BOV1	10	8.4	-16	+20	5VDC 正常工作	
---	---	---	---	---	---	

10.2	表格: 输入电流偏差测量					N
测量部件	额定电流 (A)	实测电流 (A)	电流偏差 (%)	额定偏差 (%)	备注	
---	---	---	---	---	---	
---	---	---	---	---	---	

11	表格：温升测量			P	
	t1（℃）	24.4			
	t2（℃）	24.6			
	试验电压(V)	5.8V			
测 量 部 件（部位）		实 测 温 度（℃）		实 测 温 升（K）	限定温升(K)
背部发热表面		38.8		14.2	50
口袋发热表面		55.2		30.6	50
肩部发热表面		46.3		21.7	50
显示面板按键表面		30.9		6.3	60
环境温度		24.6		/	/
绕组温升测量					N
测量部件	R1 Ω)	R2 (Ω)	实测温升(K)	限定温升(K)	绝缘等级
--	--	--	--	--	--

13.2	表格: 泄漏电流					N
	电热器具: 1.15 倍额定功率 (W)			/		
	电动器具和联合型器具: 1.06 倍额定电压 (V) ..			/		
测 量 部 位			实 测 值 (mA)		限定值 (mA)	
---			---		---	

13.3	表格: 电气强度测试					N
试验电压施加部位			试验电压 (V)		是否击穿	
---			---		---	

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16.2	表格: 泄漏电流		N
	单相器具: 1.06 倍额定电压 (V)	/	
	三相器具: 1.06 倍额定电压除以 $\sqrt{3}$ (V)	/	
测 量 部 位	实 测 值 (mA)	限 定 值 (mA)	
--	--	--	

16.3	表格: 电气强度测试		N
试验电压施加部位	试验电压 (V)	是否击穿	
--	--	--	

17	表格: 过载保护, 温升测量		N
	1.06 或 0.94 倍额定电压 (V)	--	
测 量 部 位	实 测 温 升 (K)	温 升 限 值 (K)	
--	--	--	

19.13	表格: 非正常试验		P
测 量 部 位	实 测 温 度 (K)	温 升 限 值 (K)	
口袋发热表面	30.2	Ref.	
显示面板按键表面	6.2	Ref.	
注:			

24.1	表格: 元件				N
元件/部件名称	制 造 商	型 号 / 规 格	技 术 参 数	认 证 标 志	
--	--	--	--	--	

28.1	表格: 螺钉、螺母应承受扭矩试验			N
部件名称	螺 纹 直 径 (mm)	栏 数 (I, II, or III)	施 加 扭 矩 (Nm)	
--	--	--	--	

29	表格：电气间隙					N
		过电压类别.....:		II		
		绝缘类别				
额定脉冲电压 (V)	最小电气间隙 (mm)	基本绝缘	功能性绝缘	附加绝缘	加强绝缘	结论/备注

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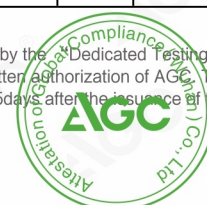
2500	---	---	---	---	---	---
4000	---	---	---	---	---	---

29. 2	表格：爬电距离，基本绝缘、附加绝缘和加强绝缘										N
工作电压 (V)	爬电距离 (mm) 污染等级										
	1	2			3			绝缘类别			
		材料组			材料组						
		I	II	IIIa/IIlb	I	II	IIIa/IIlb	B*)	S*)	R*)	结 果
≤50	0,2	0,6	0,9	1,2	1,5	1,7	1,9	—	—	—	N
≤50	0,2	0,6	0,9	1,2	1,5	1,7	1,9	—	—	—	N
≤50	0,4	1,2	1,8	2,4	3,0	3,4	3,8	—	—	—	N
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4	—	—	—	N
>50 and ≤125	0,3	0,8	1,1	1,5	1,9	2,1	2,4	—	—	—	N
>50 and ≤125	0,6	1,6	2,2	3,0	3,8	4,2	4,8	—	—	—	N
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0	—	—	—	N
>125 and ≤250	0,6	1,3	1,8	2,5	3,2	3,6	4,0	—	—	—	N
>125 and ≤250	1,2	2,6	3,6	5,0	6,4	7,2	8,0	—	—	—	N
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N
>250 and ≤400	1,0	2,0	2,8	4,0	5,0	5,6	6,3	—	—	—	N
>250 and ≤400	2,0	4,0	5,6	8,0	10,0	11,2	12,6	—	—	—	N
>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	N
>400 and ≤500	1,3	2,5	3,6	5,0	6,3	7,1	8,0	—	—	—	N
>400 and ≤500	2,6	5,0	7,2	10,0	12,6	14,2	16,0	—	—	—	N
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	N
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	—	—	—	N
>500 and ≤800	3,6	6,4	9,0	12,6	16,0	18,0	20,0	—	—	—	N
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	N
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	—	—	—	N
>800 and ≤1000	4,8	8,0	11,2	16,0	20,0	22,0	25,0	—	—	—	N
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	N
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	—	—	—	N
>1000 and ≤1250	6,4	10,0	14,2	20,0	25,0	28,0	32,0	—	—	—	N
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—	—	—	N
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	—	—	—	N
>1250 and ≤1600	8,4	12,6	18,0	25,0	32,0	36,0	40,0	—	—	—	N

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>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—	—	—	N
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	—	—	—	N
>1600 and ≤2000	11,2	16,0	22,0	32,0	40,0	44,0	50,0	—	—	—	N
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—	—	—	N
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	—	—	—	N
>2000 and ≤2500	15,0	20,0	28,0	40,0	50,0	56,0	64,0	—	—	—	N
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—	—	—	N
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	—	—	—	N
>2500 and ≤3200	20,0	25,0	36,0	50,0	64,0	72,0	80,0	—	—	—	N
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—	—	—	N
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	—	—	—	N
>3200 and ≤4000	25,0	32,0	44,0	64,0	80,0	90,0	100,0	—	—	—	N
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—	—	—	N
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	—	—	—	N
>4000 and ≤5000	32,0	40,0	56,0	80,0	100,0	112,0	126,0	—	—	—	N
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—	—	—	N
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	—	—	—	N
>5000 and ≤6300	40,0	50,0	72,0	100,0	126,0	142,0	160,0	—	—	—	N
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—	—	—	N
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	—	—	—	N
>6300 and ≤8000	50,0	64,0	90,0	126,0	160,0	180,0	200,0	—	—	—	N
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	N
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	—	—	—	N
>8000 and ≤10000	64,0	80,0	112,0	160,0	200,0	220,0	250,0	—	—	—	N
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	N
>10000 and ≤12500	40,0	50,0	71,0	100,0	125,0	140,0	160,0	—	—	—	N
>10000 and ≤12500	80,0	100,0	142,0	200,0	250,0	280,0	320,0	—	—	—	N

29.2	表格: 爬电距离, 功能性绝缘							N
工作电压 (V)	爬电距离 (mm) 污染等级							-
	1	2			3			-
		材料组			材料组			
		I	II	IIIa/IIIb	I	II	IIIa/IIIb	结果
≤50	0,2	0,6	0,8	1,1	1,4	1,6	1,8	N
>50 and ≤125	0,3	0,7	1,0	1,4	1,8	2,0	2,2	N

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>125 and ≤250	0,4	1,0	1,4	2,0	2,5	2,8	3,2	N
>250 and ≤400	0,8	1,6	2,2	3,2	4,0	4,5	5,0	N
>400 and ≤500	1,0	2,0	2,8	4,0	5,0	5,6	6,3	N
>500 and ≤800	1,8	3,2	4,5	6,3	8,0	9,0	10,0	N
>800 and ≤1000	2,4	4,0	5,6	8,0	10,0	11,0	12,5	N
>1000 and ≤1250	3,2	5,0	7,1	10,0	12,5	14,0	16,0	N
>1250 and ≤1600	4,2	6,3	9,0	12,5	16,0	18,0	20,0	N
>1600 and ≤2000	5,6	8,0	11,0	16,0	20,0	22,0	25,0	N
>2000 and ≤2500	7,5	10,0	14,0	20,0	25,0	28,0	32,0	N
>2500 and ≤3200	10,0	12,5	18,0	25,0	32,0	36,0	40,0	N
>3200 and ≤4000	12,5	16,0	22,0	32,0	40,0	45,0	50,0	N
>4000 and ≤5000	16,0	20,0	28,0	40,0	50,0	56,0	63,0	N
>5000 and ≤6300	20,0	25,0	36,0	50,0	63,0	71,0	80,0	N
>6300 and ≤8000	25,0	32,0	45,0	63,0	80,0	90,0	100,0	N
>8000 and ≤10000	32,0	40,0	56,0	80,0	100,0	110,0	125,0	N

30	表格：耐热和耐燃								N	
测量部件	球压		灼热丝试验						针焰试验	判定
	球压 温度	压痕直 径	GWT 550℃	GWT 650℃	GWT 750℃	GWFI ≥ 850℃	GWIT			
							≥675℃	≥675℃		
--	--	--	--	--	--	--	--	--	--	N

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样品照片



图 1、外观 1



图 2、外观 2

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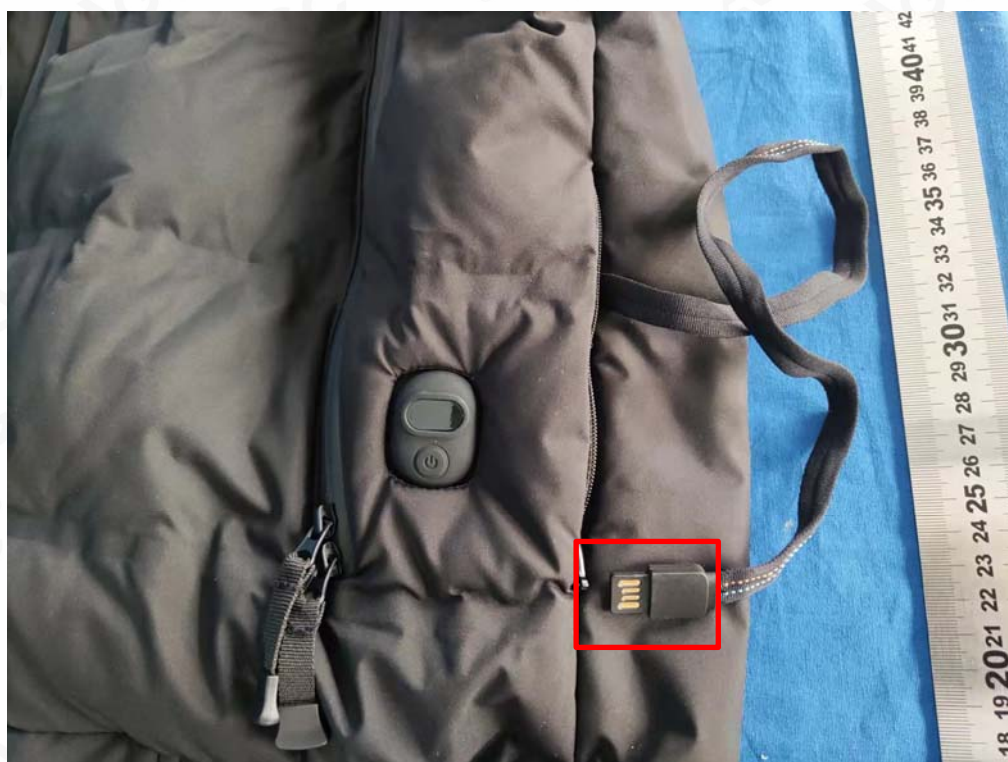


图 3、供电端口（红框内）

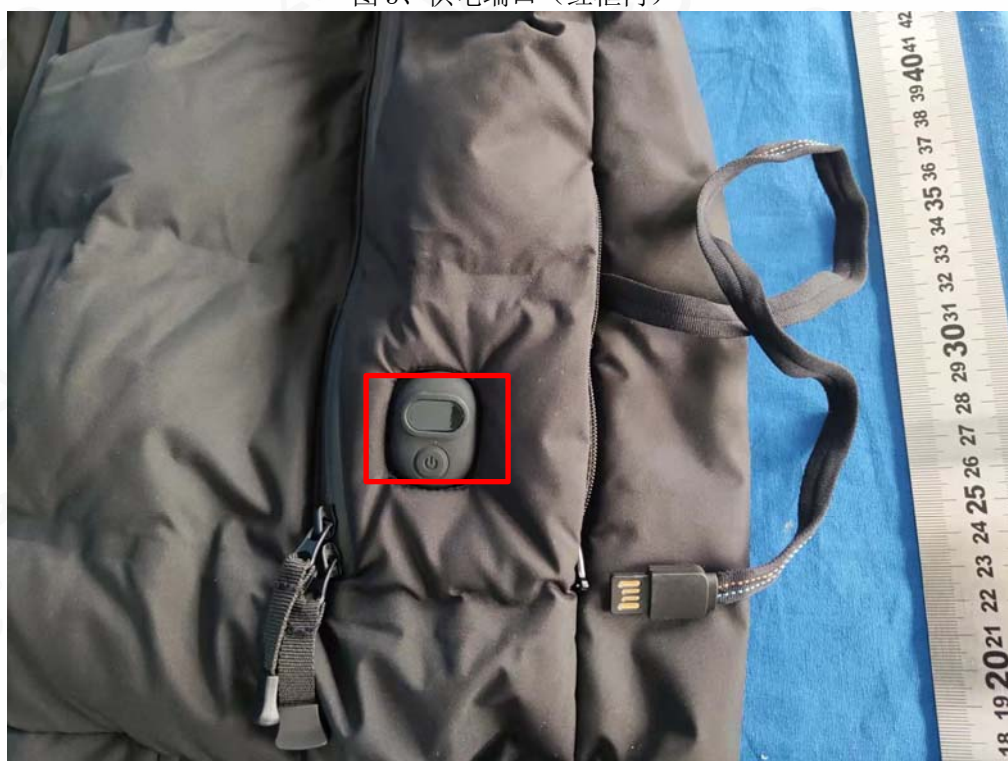


图 4、开关按键（红框内）

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试验仪器设备清单

序号	设备编号	设备名称	型号	制造商	下次校准日期	本次使用 (√)
1	/	水	/	/	/	√
2	/	纱布	/	/	/	√
3	/	正己烷	/	/	/	√
4	AGC-SA-023	秒表	PC396	天福	2022/3/1	√
5	AGC-RE-042	直流电源	DP711	RIGOL	2022/10/20	√
6	AGC-SA-007	数据采集仪	34970A	是德	2022/2/25	√

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