

规格书

SPECIFICATION

客户名称 (CUSTOMER): Ultratec

客户编号 (MODEL/TITLE): PN 130-006650

产品名称 (PART/TITLE): 4 Analog Resistive Type Touch Panel

产品编号 (PART/NO): ELHSD101172-Q43-D1D

送样日期 (DATE): 2015-12-20

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Customer Approver		
核准	审核	确认
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和圣达光电有限公司		
核准	审核	制作
APPROVED BY	CHECKED BY	PREPARED BY

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1. 保证 Warranty

此规格触摸屏，从出货之日起或客户收到产品后，至少一年内应符合下列正常条件下的储存和使用规格

Products manufactured to these specifications shall be capable of meeting all characteristics from delivery onwards or for a minimum period of 1 year of the customer received when stored and used as specified under normal conditions within the contents of these sheets.

2. 适用范围 Scope

此产品是数字电阻触摸屏，作为车载的输入装置。

This product is for Digital Resistance Type Touch Panel used as the input devices for GPS

标准环境为：23℃,65%RH 和 1013hPa，应在常温条件（5℃-35℃），湿度为 45%-85%RH，和气压为 860hPa-1060hPa 下进行测试。倘若有必要对产品进行再测试，并且为使产品测试准确，可在 24 小时放置之后，在 23℃±5℃，65%RH±10%RH 和 860hPa-1060hPa 下进行测试。

The standard conditions are 23℃,65 %RH and 1013hPa, and measurement shall be done at normal temperature(5℃ to35℃) and humidity(45%RH to 85%RH) and normal atmospheric pressure(860hPa to1060hPa) .In the case of accuracy and reappearance necessity, measurement shall be done at 23℃ ± 5℃ ,65 %RH ± 10 %RH and 860 h Pa to 1060hPa after exposing in these conditions for 24 h.

(备注：每片 T/P 只能进行一种寿命或环境等可靠性测试.)

(Remark: We only do the reliability test of life or environment for each T/P)

3. 特征和规格 Features and General Specifications

3.1 类型 Type: 数字式电阻触摸屏 Digital Resistance Type Touch Panel

3.2 输入方式 Input Method: 手指或专用笔 Finger or special Pen

3.3 结构 Structure

外形、结构和尺寸详见图纸

Shape, structure and dimension are referred to attached drawing

结构 Construction	所用材料 Materials used	注释 Comment
LENS	PET	T=0.188mm
上线 Top Circuit	PET 薄膜 ITO Film	Anti-glare Hard & Mate anti-newton 雾面防牛材料 T=0.188mm
下线 Bottom Circuit	Normal glass 玻璃	Thickness 厚度 T=1.1mm
引出线 Tail type	FPC	T= 0.3±0.05mm
背胶 DST	3M9475	T=0.1mm

4. 主要尺寸规格 General dimension Specifications (L=long 长; W=wide 宽; T= thickness 厚)

项目 Item	规格 Specifications	单位 Unit
外形尺寸 Dimensional Outline	249.8x165.1x1.75	mm
可视区 Viewing Area	222.8x125.1	mm
驱动区 Active Area	225.9x128.4	mm
绝缘点大小及点距 spacer dots dimension & pitch	4.5*4.5*0.05mm*90 °	mm

5. 环境参数 Environment Conditions

项目 Items	规格 Specifications	备注 Remark
工作温湿度范围 Operating temperature & Humidity	-10℃-+60℃， <90%RH	无结露
储存温湿度范围 Storage temperature & Humidity	-20℃-+70℃， <90%RH	无结露

6.机械性能 Mechanical characteristics

项目 Item	规格 Specifications	备 注 Remark
操作压力 Operation force	60g MAX	用 R0.8mm,polyacetal 材质笔头测试
耐久性 Tapping durability	敲击寿命 Tapping durability	>1000000 times
	笔划寿命 Pen sliding durability	>100000 times
表面硬度 Surface Hardness	3H 以上 JIS K5400 8.4	3H 铅笔 45 度角,500g 力划过之后无刮花
FPC 剥离强度	2000gf	水平方向
	500gf	朝膜面垂直 90°方向
撞击 hit	use ϕ 9.0mm stainless steel ball, drop height=70cm	No function fail and no glass broken. 实际情况无破损
静态承重 Static bearing	[500g 置于30cm² 内, 30秒] (机壳向下)	实际情况无破损

7.光学特性 Optical characteristics

项目 Items	规格 Specifications
透过率 transmittance	>82%
雾化度 Haze	<5%

8.电器性能 Electric characteristics

项目 Items	规格 Specifications	备注 Remark
最大电压值 Max voltage	5V（直流） 5V（DC）	
额定电流值 Rated current	上线路 Top layer	35mA
	下线路 Bottom layer	35mA
回路电阻 Terminal resistance	X 方向 direction:300Ω ~ 900Ω	
	Y 方向 direction:100Ω ~ 600Ω	
绝缘阻抗 Insulation resistance	>20MΩ以上 10MΩ or over	DC25V
线性Linearity（划线位置为AA区内缩2mm）	<1.5%	
触点抖动时间 Chattering Time	<10ms	

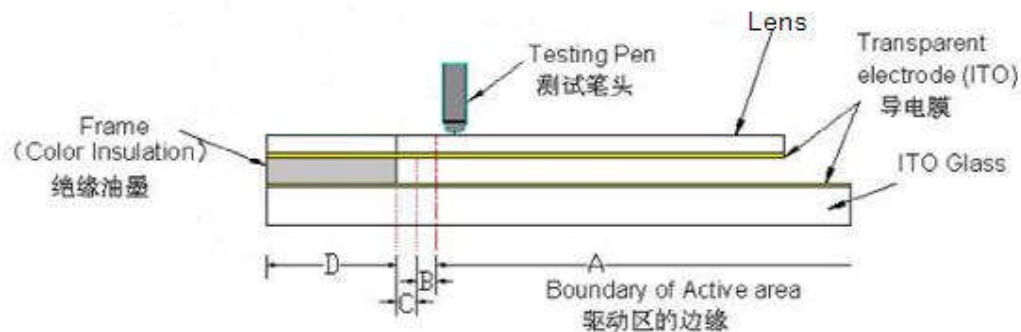
9. 结构 structure

Shape and dimensions: As specified in individual drawings.

形状和尺寸：按图档说明

Structure, and Area definition: The structure and the performance guaranteed areas of this touch panel are defined below.

构造和区域定义：T/P 结构与外观确保如下：



Area-(A) : Active area

区域(A): 驱动区

The area guarantees a touch panel operation with the following characteristics when pressed.

在按压 T/P 的驱动区时能够保证以下特性操作正常：

Operation force 操作压力 Electric characteristics 电器性能 Tapping durability 敲击寿命

Pen sliding durability 笔画寿命

Area-(B) : Operation non-guaranteed area

区域(B): 非保证操作区

The area does not guarantee a touch panel operation and its function. When this area is pressed, touch panel shows degradation of its performance and durability such as a pen sliding durability becomes about one-tenth compared with the active area (Area- (A) as guaranteed area) and its operation force requires about double. About 0.5 mm outside from a boundary of the active area corresponds to this area.

此区域不保证 T/P 操作和功能正常。当按压此区域时，T/P 的外观和寿命将会下降。如：当对它做笔画测试时，笔画寿命大约为驱动区寿命的 1/10（如图中驱动区 A），并且操作压力也要求是驱动区的两倍。此区域位置大约为驱动区外侧 0.5mm。

Area-(C) : Pressing prohibition area

区域(C): 禁止按压区

The area forbids pressing because an excessive load is applied to a transparent electrode and a serious damage is given to a touch panel function by pressing. About 0.5mm outside from a boundary of Area-(B)” the operation non-guaranteed area” corresponds to this area.

此区域为禁止按压的原因是施加重压会造成透明电极破坏，并且 T/P 的功能严重损坏。此区域位置大约为区域(B)即“非保证操作区”外侧 0.5mm.

Area-(D) : Non-Active area (Frame)

区域(D): 非驱动区

The area does not activate even if pressed.

此处按压不动作。

(Remark: In order to prevent unusual performance degradation and malfunction of a touch panel, please inspect firstly whether the set case designing and touch panel assembling method are reasonable or not, and then start to install and assemble after surely confirming the item "4.4 Cautions for installing and assembling".)

（备注：为了避免产品外观不良和产品出现故障，请预先检查实施的机壳的设计方案和 T/P 的上机组合方式是否合理，并且了解项目“4.4 组合上机的注意事项”后再上机。）

Area-(B)+Area-(C): Sensitive area

区域(B)+区域(C): 敏感区

Area-(B) and area-(C) both belong to the sensitive area. This area has a clearance between top and bottom contact side. Great press resulting in transparent electrode cracks, function defect to be exact, will deform surface transparent electrode. Please think about structure of sensitive area and case in order to avoid terminal user to fail to touch this area.

区域 (B)、(C) 为敏感区，由于该区域在产品上下导电面之间存在间隙，按压此处时 ITO 导电膜受压产生较大变形，引起 ITO 导电膜断裂，从而使触摸屏丧失功能。故使用触摸屏产品时，一定要充分考虑敏感区的尺寸及外壳的构造，必须避免最终的用户使用时触及到此区域。

Remark: Please add a layer of gasket/ cushion around it before assembling touch panel. Take care that gasket/ cushion's location should be in the limits of Frame area's location. Min. 0.2mm outside from an inner boundary of Frame area corresponds to this area:



10. 信赖性实验 Reliability Test

10.1 环境实验 Environment Test

Test		Condition	Criteria(function)	Criteria(Appearance)
Operating temperature & Humidity 工作温湿度范围	high temperature	70℃、240hrs	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)
	low temperature	-20℃、240hrs	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)
Storage temperature & Humidity 储存温湿度范围	high temperature	80℃、240hrs	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)
	low temperature	-30℃、240hrs	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)
Thermal shock 冷热冲击		-20℃(1hr) ~70℃(1hr) 50cycles	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)
High temperature and high humidity 高温高湿		60 ℃、 90%RH、 240hrs	Normal performance*after Recovery time (≧24hrs)	No defect**after recovery time(≧24hrs)

Have touch response,
inspection include Newton ring ,puffines etc.

10.2 Durability Test 耐久试验

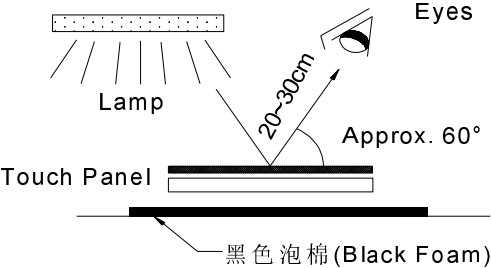
	项目 Items	规格 Specifications	备注 Remark
5	敲击试验 Tapping testing	使用 $\phi 1.6$ 、 60° 的橡皮头，250g 的力度、频率 2 次/秒来回敲击 100 万次后 Tapping more than 1000000 times with 250g force and 2times/s frequency by $\phi 1.6$ rubber testing head, whose hardness is 60°	满足“8.电器性能”项目要求 The requirements in item “8. Electric characteristics” shall be satisfied
6	笔画试验 Pen sliding testing	(1)画线的位置应位于AA区以内，距离AA区边缘 $>2\text{mm}$.) (2)使用 $\phi 1.6$ 聚纤维酯笔、200g的力度、以频率为2次/秒在相同的位置（60mm/sec）来回笔画10万次后 (1)The sliding place should be more than 2mm inside from the boundary of active area.) (2)Sliding more than 100000 times with 200g force and 2times/s frequency in the same position (60mm/sec) by $\phi 1.6$ Polyacetal pen	满足“8.电器性能”项目要求 The requirements in item “8.Electric characteristics” shall be satisfied
7	引出线拉力测试 Flexible pattern heat seal Peeling strength	15. X 方向：2000g (水平方向 180° 剥离) 16. Y 方向：500g (朝上方向 90° 剥离) 17. X: 2000g (peeling by 180°) 18. Y: 500g (peeling upward by 90°)	
8	引出线焊接耐热测试 Flexible pattern heat resistance to soldering	手工焊接温度应小于 260°C ，持续 2 秒。而重复焊接只能 2 次。烙铁应在小于 60W 的环境下（直径最大 1mm） Manual soldering shall be done at temperature 260°C Max. for 2 s Max. Only one time reordering is allowed for reworking. Soldering iron with 60 W Max(Tip diameter: $\phi 1\text{ mm}$ Max.)	满足“5.机械性能”里的“操作压力”和“8.电器性能”项目要求 The requirements in “Operation force” of the item “5. Mechanical characteristics” and “8 .Electric characteristics ” shall be satisfied
9	引出线耐弯曲性测试 Flexible pattern bending resistance	弯曲半径为 2mm 弯曲次数为 10 次或 10 次以上。弯折角度 $90^\circ \sim 180^\circ$ 和弯折力度 250g Bending 10 times or more by bending radius R2mm 。 Bending angle; $90^\circ \sim 180^\circ$ Pulling force; 250g	满足“8.电器性能”里的“回路电阻”项目要求。 The requirements in “Terminal resistance” of the ite item “8. Electric characteristics” shall be satisfied.

10.3 包装跌落测试

项目 Items	条件 Condition	标准 Criteria
包装跌落测试 Package drop	一角,三边,六面自由落体, One corner, three edges, Six flat by free-falling 包装重量(kg) 跌落高度 (cm) 0.45-9.52 76.2 9.52-18.59 60.96	Pass product spec 满足产品规格

11.外观检验标准 Appearance limit standard

11.1 检查规则 Inspection Criteria

项目 Item	条件 Conditions	备注 Remark
检查范围 Inspection area	应用区域: 可视区 Application Area; View Area (1) 所有的外观不良只要是在可视区以外对产品功能不造成影响均不考虑在内 Any defects in invisible shall be ignored unless they affect electrical performance. (2) 所有可以使用软布用酒精擦拭得掉的污染物控制在总数量的3%以内。 Contamination that can be cleaned using soft cloth with ethyl alcohol drop is amount 3% of quantity in.	
检验条件 Inspection Conditions	视力1.0及以上的健康成人(带眼镜亦可),物体与检测者眼睛距离20到30厘米处检测。 The inspection should be conducted by a healthy inspector with a vision of 1.0 or above (eyeglasses acceptable), and at a distance 20 to 30cm between the object and the inspector's eye. 使用机器: 荧光灯30W Inspection device: florescent light 30 W	
检验环境 Inspection Environment	 <p>The diagram illustrates the inspection setup. A 'Lamp' is positioned above a 'Touch Panel'. An observer's 'Eyes' are shown at a distance of '20-30cm' from the panel, with a viewing angle of 'Approx. 60°'. The panel is supported by '黑色泡棉 (Black Foam)'.</p>	

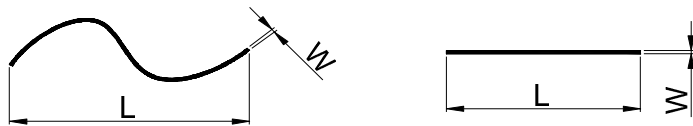
11.2 检验基准 inspection standards

产品可视范围外若有裂缝，刮伤，异物等外观不良，不影响产品电气特性的，也可接受。
For areas outside the visible range, it is acceptable if there is no crack, scratch, or foreign objects that can greatly affect the electric performance of this product.
限度样品用于本基准中未尽描述的裂缝，刮伤或者异物等外观不良。
Limit samples shall be used for cracks, scratch, or foreign objects which are not described in this standard

11.3 点状异物 Dot-like foreign object(D = longest diameter)

平均直径 Average diamete (mm)	基准 Judge criterion	备注 Remark
$D \leq 0.15$	不计 Ignored	2个以上缺陷 Up to total two defects
$0.15 < D \leq 0.2$	2个或2个以下(异物间隔小于40mm ，不接受) 2 objects or less, with the Failure under distance 40mm	
$0.2 < D \leq 0.3$	1个， 异物间隔小于40mm ， 不接受 one, with the Failure under distance 40mm	
$D > 0.3$	不接受 Reject	

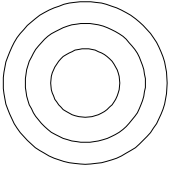
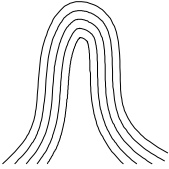
11.4 线状异物、毛絮、刮伤（W=宽度、L=长度） Linear foreign object (W=Width, L=Length)



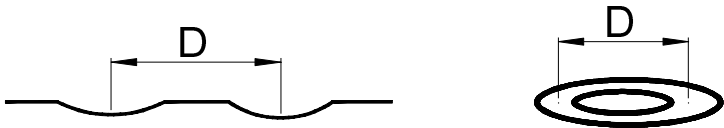
刮痕

宽度 Width (mm)	长度 Lengt (mm)	基准 Judge criterion	备注 Remark
$0.03 < W \leq 0.05$	$L \leq 2.0$	2个或2个以下(异物间隔小于40mm ，不接受) 2 objects or less, with the Failure under distance 40mm	
$0.05 < W \leq 0.07$	$L \leq 2.0$	1处 (异物间隔小于40mm ，不接受) one, with the Failure under distance 40mm	
$W > 0.07$	$L > 2.0$	不接受 Reject	

11.6 牛顿环 Newton ring
根据 4.1 外观检查方法确认 To be confirmed according to No.4.1 inspection of appearance
外观牛顿环限定个数 Appearance Inspection Limit sample

项目 Items	基准 Judge criterion	备注 Remark
规律性 Regular	在整个触摸屏检查区域内超过1/6范围；不接受 The area covered by Newton Ring is more than 1/6 of the whole TP surface; Reject 在整个触摸屏检查区域内小于1/6范围，并且在有照明环境下不影响透光率及失真；接受 The area covered by Newton Ring is less than 1/6of the whole TP surface, and it doesn't affect transmittance and clarity of TP under the lighting ambient; Accept	
非规律性 Irregular	在整个触摸屏检查区域内在照明环境下超过1/9范围；不接受 The area covered by Newton Ring is more than 1/9 of the whole TP surface under the lighting ambient ; Reject	
	在照明环境下牛顿环有影响清晰度和透光率；不接受（不计牛顿环尺寸） If the Newton Ring affect the transmittance and clarity under lighting ambient, it is NG. (Neglect the Newton Ring size)	
	在整个触摸屏检查区域内小于1/9范围，并且在有照明环境下不影响透光率及失真；接受 The area covered by Newton Ring is less than 1/9 of the whole TP surface, and it doesn't affect transmittance and clarity of TP under the lighting ambient; Accept	

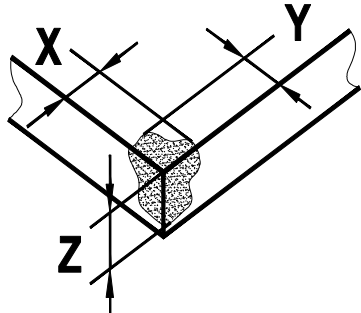
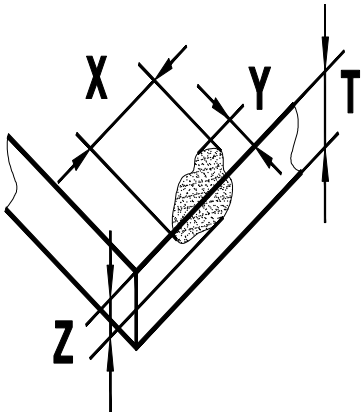
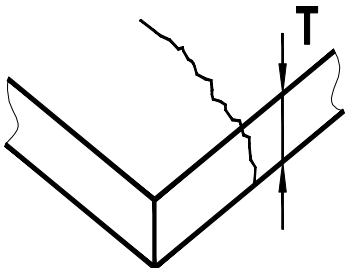
11.7 鱼眼、气泡 Fish eye、air bubble



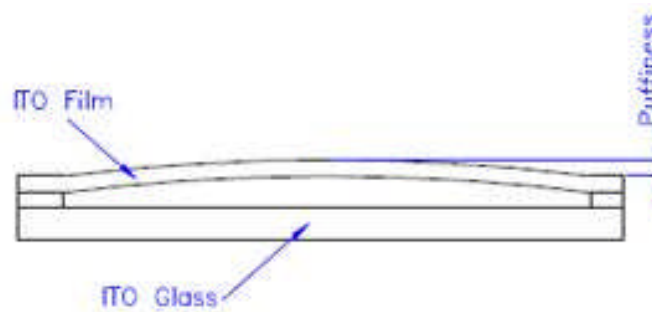
鱼眼，凹痕与气泡

$D \leq 0.1\text{mm}$ acceptable
$0.1 < D \leq 0.15\text{ mm}$ distance $\geq 40\text{mm}$ Max.1 EA，距离40mm以上可以接受
$0.15 < D \leq 0.20\text{ mm}$ distance $\geq 40\text{mm}$ Max.1 EA，距离40mm以上可以接受
$D > 0.2\text{ mm}$ C: not acceptable

11.8 破裂和裂纹 (T=PMMA厚度) Chip and crack (T= PMMA thickness)

项目 Item	尺寸 Size (mm)	长度 Length (mm)		接受个数 Acceptable Qty
角 Corner		X	≤1.0	1) 若角断裂位于金手指处，严重影响产品的功能，T/P 属不良品； 2) 若角断裂位于线路上，严重影响产品的功能，T/P 属不良品。 1) Corner fragment in the golden finger that seriously affects the product function is regarded as a defect. 2) Corner fragment in the circuit that seriously affects product function is regarded as a defect.
		Y	≤1.0	
		Z	≤T	
角以外的地方 Other than corner		X	≤2.0	边断裂: X<2.0mm, Y<1.0mm 和 Z<GT，可以忽略。 1) 若边断裂位于金手指处，严重影响产品的功能，T/P 属不良品； 2) 若边断裂位于线路上，严重影响产品的功能，T/P 属不良品。 Side fragment:X<2.0mm and Y<1.0mm and Z<GT it is ignored 1) Side fragment in the golden finger that seriously affects the product function is regarded as a defect. 2) Sidefragment inthe circuit that seriously affects product functionis regarded as a defect.
		Y	≤1	
		Z	<T	
渐裂或者裂纹 Progressive Crack or chip		若有任何渐裂或者裂纹，不接受。 Judged unacceptable if there is any progressive crack or chip.		

11.9 凸出（包括波状弯曲）Bulge (undulation included)



膜鼓高度在如下范围内判定为合格品。

Condition	Criteria
For 2inch ~3inch: 0.35mm MAX	Pass the specification
For 3inch ~5.5inch: 0.4mm MAX	Pass the specification
For 5.6inch ~9inch: 0.5mm MAX	Pass the specification
For 10inch ~17inch: 0.55mm MAX	Pass the specification

12 使用过程中注意事项 Precautions in use

为了避免不良事故的发生和产品性能的破坏，请遵守如下警告及禁止事项。

In order to prevent accidental use and performance deterioration, please keep the following precautions and inhibited points.

12.1 储存注意事项 Cautions for storage

储存产品时须按样品承认书的温湿度要求放置，注意不可受日光直射或重物重压。

Store the products at the temperature and humidity mentioned in the specification in a state storage of package with care not to expose the products to the direct sunlight or stresses.

12.2 操作过程注意事项 Cautions for operation

(1) 请勿以锐利刀刃或其它尖锐制品在本制品上磨擦。

Don't scratch or rub with knives or other sharp substances.

(2) 请勿任意拉扯或弯折本制品。

Don't stretch or bend.

(3) 请勿将产品堆叠放置以免引起表面刮花造成外观不良

To avoid scratch surface of product, so don't pile product.

(4) 请避免将本制品靠近或暴露于有机溶剂，酸性气体的环境下使用及存放。

Keep away from organic solvent or acidic environment.

(5) 请勿任意剥离或扯解本制品。

Don't detach the surface or dissemble the product.

(6) 请勿拉其尾端(FPC)以提起本制品，应以提起制品本体为正确的方式。

Do not lift the product by the FPC. Lift by the product body instead.

(7) 制品上有污沾时,请以柔质绵布或沾有中性洗剂,酒精的布料轻拭。若不慎有刺激性药品附着于制品上时，在不影响人体健康状态下,请迅速擦拭。

To remove dirt or smear on the surface, use soft cotton or cloth with ethanol wipe off gently. For irritating substances, immediately wipe off if it doesn't affect personal health.

(8) 由于长期使用, 点击按键的位置很可能会有略微的上下偏移, 因此建议最好使用电流和软件的形式进行归零操作。

The input position may be fluctuated a little through long-time use. It is desirable to provide a zero-adjustment function by using a circuit and software.

(9) 我司不保证驱动区外侧的操作原因是: 此操作对导电膜会有严重的损坏。

Operation at the out of Active Area is out of our guarantee. Because it causes a serious damage of a transparent electrode.

12.3 搬运注意事项 Cautions for handling

须保持产品的透明清晰度, 因而请在接触产品之前戴上清洁的指套、手套和面罩以免留下指纹或污点, 并且握拿产品时请握住产品的四周

Transparency is an important factor for the product. So, please wear clean finger sacks, gloves and mask to protect the products from fingerprint or stain attach, and also hold the portion outside the view area when handling the panel.

12.4 组装上机注意事项 Cautions for installing and assembling

(1) 不要对产品施加额外的拉力。

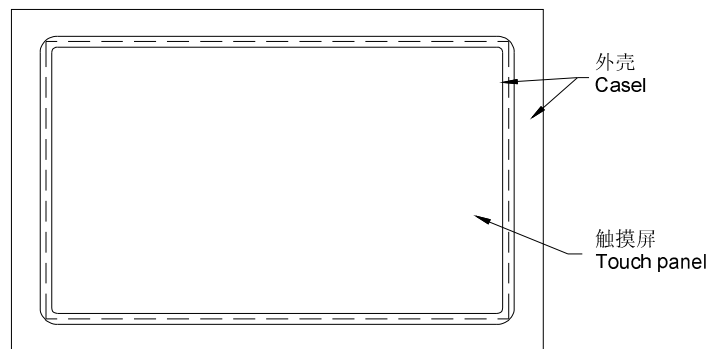
Do not give excessive strain to the product.

(2) T/P若有通气槽, 请在设计产品结构时, 注意产品附近不能有液体物和粉状物。

The transparent touch panel is provided with an air groove. Therefore please design the structure not to store any liquid nor any fine particles near it.

(3) 产品的每个角落请勿倾斜。当产品定位组合上机时, 我们建议贵方可以在设计机壳时, 将机壳四角设计为“R”角形来固定产品, 以致不会对产品的四角施加压力。

The corners of the product are not chamfered. When positioning and fixing the product on the case, We suggest that you would provide a R part on the corner of the case so as not to apply load on the corner of the transparent touch panel.



(4) 当使用双面胶等将产品与 LCD 或其它机器组合时, 请使用充分的力按压 T/P 的非动作区从而使 T/P 与 LCD 或其它机器粘合既无脱落又无空隙。当组合时, 请平衡压合 T/P 角落和四周, 由于 T/P 与机壳组合时起初粘合需一定的时间, 所以当产品起初粘合好后, 请勿接触产品。

When this product is attached on LCD or other target by using a double-sided tape etc., put an enough pressure onto the non-active area (Frame) of a touch panel so that neither exfoliation nor gap may take place between a touch panel and LCD or other target. As attachment, please apply pressure equally onto the corner part and four sides of a touch panel. There is a case to take a time being for conducting an original adhesion, therefore, please do not move the product after attachment.

12.5 其它注意事项 Other cautions

(1) 由于环境温湿状态易发生变化，因此请保持产品勿结露，因为产品结露会引起产品的性能严重劣化。

Please note that dew gathering in the panel due to abrupt temperature or humidity change, etc. May cause deterioration of performance.

(2) 当产品组合上机时，若有硫性材料如硫化橡胶，这种材料在机壳附近可能会引起硫化反应，正因为这种异常现象的出现从而导致产品的线性紊乱，功能下降，请务必谨慎。

When this product was built into the set, if there is vulcanization material such as vulcanized rubber which has a possibility of generating the sulfuration gas near the set, since abnormalities will be caused to wiring of the product and it will become the cause of functional degradation, please give a constitutional cautions.

(3) 虽然我司很谨慎地保证产品的品质，但是还会有像功能下降、断路、短路现象出现的可能。因此，贵方在设计产品装置的同时，请预先要研究引起产品功能不良的因素，并且要考虑产品的配置安全性。

Although full care is taken to ensure product quality, failure modes such as degradation, short circuits, or open circuits might be caused. Therefore, to design a product set, please study the affects of any single failure of the panel in advance and consider the safety of product configuration

13 附件 Attachment

13.1 工程图 Engineering Drawing

