General specification Membrane switches

The specifications in this document only applies to membrane switches.
All our membrane switches are ROHS and ECHA / REACH compliant.

1.0 Electrical:

1.1 Operating Voltage:	Min. 100mV - Max. 42 V. (DC)
1.2 Operating Current:	Min. 500 µA- Max.100 mA.
1.3 Insulation Resistance:	>100 M Ω at 100 V (DC)
1.4 Power Consumption:	Max. 0,6 W
1.5 Closed Loop Resistance:	<100 Ω (on Tail end)

2.0 Mechanical:

2.1 Bounce time key with metal dome:	< 10 Ms
2.2 Bounce time key with embossed dome:	< 20 Ms
2.3 Actuation force:	as specified on the drawing
2.4 Life expectancy key:	>10^6 activations

3.0 Materials:

3.1 Overlayer:	Polyester, film-protection on windows
3.2 Adhesive:	Open source or as specified on drawing
3.3 Dome retain:	Polyester 100µm with holes
3.4 Shielding for EMC:	On request: Polyester screen printed with a silver grid.
3.5 Circuitry:	Polyester 125 µm
3.6 Back plate:	On request : 3M 7957MP (3M 467)
3.7 Metal dome:	Gold plated with dimple. Other types on request.
3.8 LEDs:	SMD LED (V_R 5V I_F25 mA) bonded on PET with Silver and SMD adhesive and secured with epoxy to optimize mechanical properties. Low Current Leds: on request.
3.9 EL backlighting system:	The EL light, used for backlight, can be integrated in membrane switches.
3.10 Colours:	Blue, Green and White. (note: white appears pink when in off state)

3.11 Operating Voltage	100Vac.
3.12 Operating Current:	Typical: 0,20mA/cm², depending on invertor type.
3.13 Operating Frequency:	400 Hz.
3.14 Brightness:	Typical: 15 cd/m².
3.15 Life expectancy:	> 10.000 hrs.

4.0 Screen-printing circuitry:

4.1 Insulation ink:	Screen printed on complete circuitry including the tail, except electrical connection.
4.2 Circuitry with jumpers:	Screen printed Insulation layer.
4.3 Graphite:	On cable output and silver metal dome pads.

5.0 Screenprinting over layer and complete product visual inspection:

5.1 The graphics are screenprinted on the backside of the overlayer.

5.2 The Texturing or Clear Lacquer for windows are screenprinted on the frontside of the overlayer.

5.3 Color tolerance: *DE* 0,75

5.4.0 **Complete Product Visual Inspection Method:**
5.4.1 Inspection Distance: 50 cm
5.4.2 Inspection Time: ≤ 10 sec.
5.4.3 Inspection Angle 45º (no reflection allowed)
5.4.4 Approval Criteria
Inclusions / scratches or any foreign particles, should not be noticed.

6.0 Cable output

6.1 Cable output protection:	PET layer.
6.2 Cable output bending radius:	> R=3 mm.
6.3 Identification on Tail includes:	Company Name. Drawing number and Revision. Manufacturing Date. Replacement number.
6.4 Cable output:	Suitable for FFC connector.
6.5 Pitch:	> 1 mm
6.6 Female connector pitch:	2,54 mm
6.7 Closed Border:	Membrane switch with closed border do meet IP 67 specification.

7.0 Embossing or dome embossing:

7.1 At 45°C the embossing should not show any “flattening” or deformation.

8.0 Temperature range:

8.1 With metal dome as tactile feedback

Operating temperature:	-40°C … + 80°C
Storage temperature:	-40°C … + 80°C

8.2 With dome embossing as tactile feedback

Operating temperature:	-20°C … + 45°C
Storage temperature:	-20°C … + 45°C

8.3 With EL integrated

Operating temperature:	-20°C … + 50°C
Storage temperature:	-30°C … + 60°C

9.0 Water resistance:

9.1 IP 65 on the overlayer side.

9.2 IP 67 with closed border.

10.0 Humidity (MBS Testing Conditions)

10.1 Climate Chamber:	60 °C / 90% RH
10.2 Testing time:	250 hrs.
10.3 Operating Voltage:	30Vdc.
10.4 Series Current Limiting Resistor:	100K
10.5 Max Drain Current:	< 100 µA at 50 hrs.

10.6 Humidity (EL Testing Conditions):

10.7 Climate Chamber:	50 °C / 90% RH
10.8 Test time:	200 hrs.
10.9 Operating Voltage on specimen:	100Vac.
10.10 Operating Frequency:	400Hz.
10.11 Brightness:	>15 cd/m²

11.0 Production process:

11.1 Separate layers from Membrane switches are assembled with larger outline dimensions in respect to final product outline dimension. This includes the overlayer.

11.2 After assembly the complete membrane switch is being stamped to its final outline dimension.

11.3 If sample housing for reference is provided, it is more important that the membrane switch fits perfectly in the housing, rather than follow the dimensions on the drawing.
In these cases the drawing will point out that the outline dimensions are for reference only.

11.4 A hole or slit for air escape is present for air pressure equalisation in the spacer channels and spacer chambers.

12.0 Chemical resistance:

12.1 Alcohols

12.2 Dilute acids

12.3 Dilute alkalis

12.4 Esters

12.5 Hydrocarbons

12.6 Ketones

12.7 Household cleaning agents

13.0 Packaging:

13.1 The goods are in a carton box with plastic bags and synthetic foam.

13.2 On every plastic back is a label.

13.3 On every carton box is the same label.

13.4 Example.

touchtronic
Order No:
Drawing No:
Rev. No:
Replacement No:
Quantity:
Date of Manufacture:
Carton No.:

14.0 Testing:

14.1 Together with the sample delivery there is always a Sample test report (STR)

14.2 Together with the mass production there is always a Production test report (PTR)

14.3 In the PTR you find a reference of the approve sample (Manufacturing date)

14.4 Standard: electrical test 100 %

15.0 How to deliver digital data to Touchtronic:

15.1 Over layer: Corel Draw minimum version 8

15.2 Artwork Illustrator 10
Freehand 10
All the different colours should be in separate layers
The text should be in curves.

15.3.0 Dimension drawing:

15.3.1 Outline dimension, (or eventually housing)

15.3.2 Windows for display LCD or LED

15.3.3 Windows for LED lamp (LED colour, when LED is integrated)

15.3.4 EL backlighting (Which area should light up and EL colour)

15.3.5 Holes.

15.3.6 Cable output, Key's, EL and shielding

15.3.7 Cable length.

15.3.8 With or without connector (Specification connector on the PCB (Pitch > 1 mm)

15.3.9 Pin 1 position

15.3.10 Electrical plan

15.4 Colours in RAL / Pantone or Colour sample.

16.0 Handling Remarks:

16.1 Before assembling the membrane switch, please read the handling remarks in order to have the optimum function of the membrane switch!

17.0 Storage:

17.1 Store products not beyond the temperature and humidity range as mentioned in the specification.

17.2 Store products in the state of package.

18.0 Unpacking:

18.1 Do not hold onto the tail when taking out the membrane switches from the package.

19.0 Handling:

19.1 Don't push any key when the membrane switch is not properly supported.

19.2 Please pay attention not to harm the membrane switches with tools which can cause malfunction.

19.3 Do not put heavy objects on the membrane switch

20.0 Assembly:

20.1 Please take care that the carrier or the housing, onto the membrane switch will be assembled is removed from grease, dust or other particles.

20.2 Release the window protection film first and than pull of the adhesion liner.

20.3 Please take care that the membrane switch is mounted without air entrapments between the membrane switch and the carrier or housing.

20.4 As it is impossible to remove a membrane switch without damaging it, the membrane switch should be mounted in one handling.

20.5 Minimize the stress of the housing to the membrane switch.

20.6 Pay the highest attention to avoid any stress to the cable output.
Stress may cause a disconnection.

20.7 Don't touch the windows or adhesive on the backside.

21.0 Cleaning:

21.1 Membrane switches may be cleaned with an alcohol based cleaner.

22.0 General:

22.1 If you need advise on design and or assembly of Membraneswitches, do not hesitate to contact Touchtronic.