

Water tester for ethanol fuel	<u>WTE85</u>	A-2	2010-10	B. Lindqvist	
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This water-test unit is actually a simple conductivity meter especially designed for analysis of the fuel E85. Then the results are presented by one of the four LED's, so it naturally has its limitations.

Usually works conductivity meters with AC but for quick checks is also DC suitable and the whole becomes much easier to build. This also applies to the probe, which can be constructed by small leftover laminate. Do you want to build a better conductivity meter? If so, maybe Fcm22 fits better and is also available in this document.

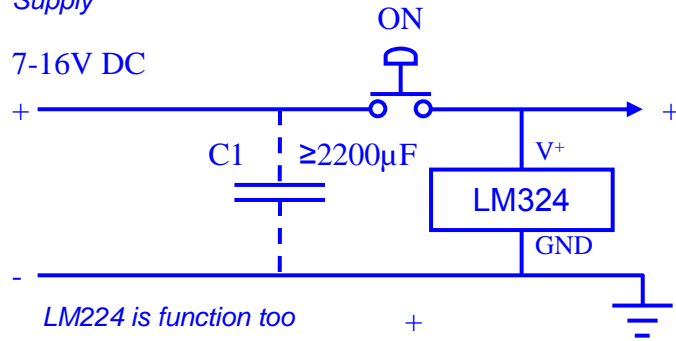
WT85 is small and portable and can be stored in the car's glove box. It runs on 12V but also with a 9V battery. If you connect an electrolytic capacitor at the terminals, you can upload it to 12V and then perform a test somewhere else.

WTE85 also has a button for multiplying the range by ten. It allows you to estimate the conductivity far over 1.2 $\mu\text{S/cm}$ (up to 12 $\mu\text{S/cm}$).

Board type	Double sided	Technique	Based on SMD	EMI	No	Supply	7 - 16 VDC
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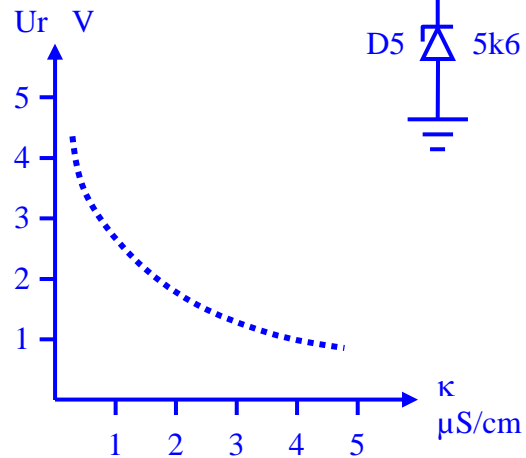
Supply

7-16V DC



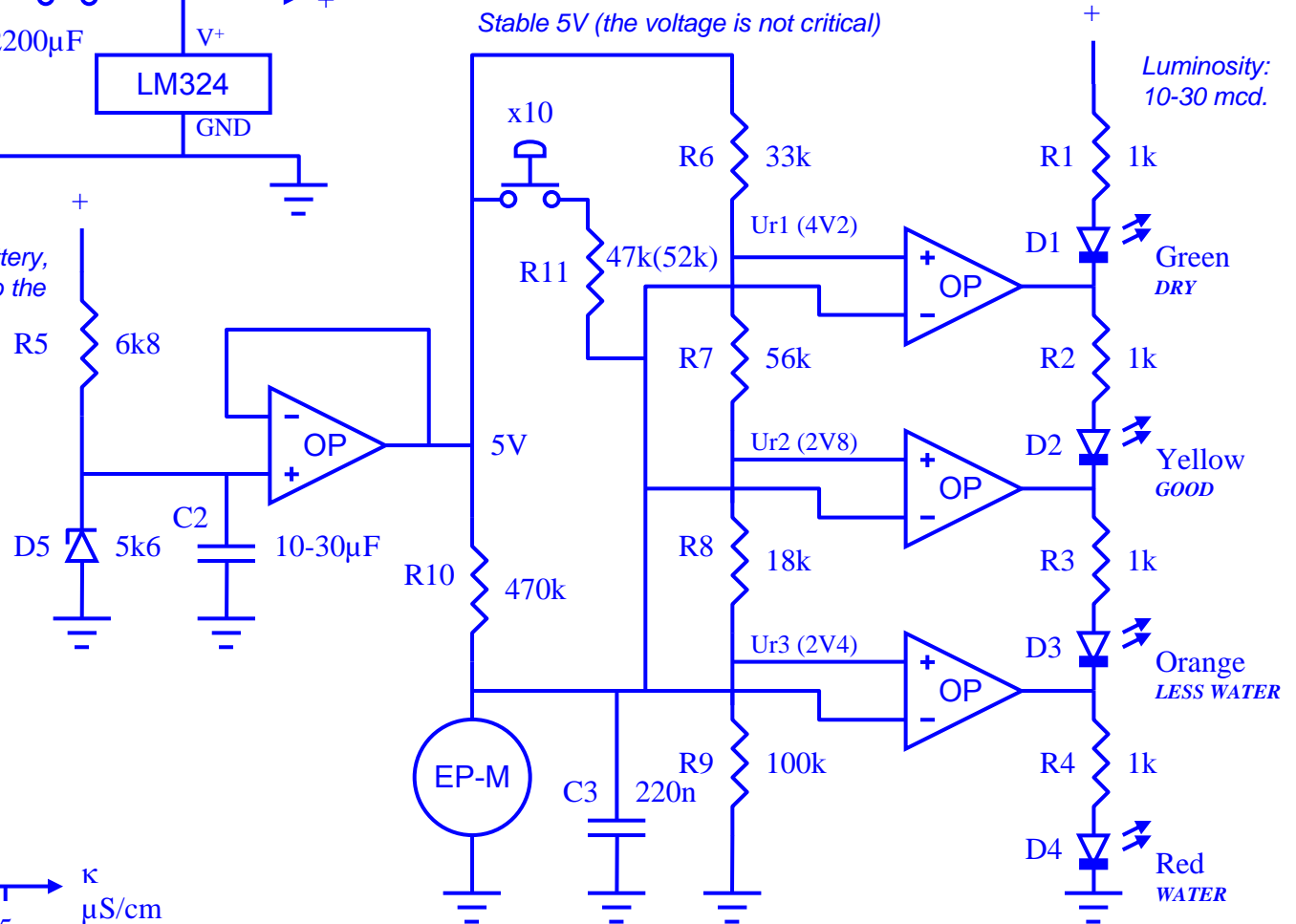
LM224 is function too

C1 can be used as a battery, if you have a long way to the object.



WTE85

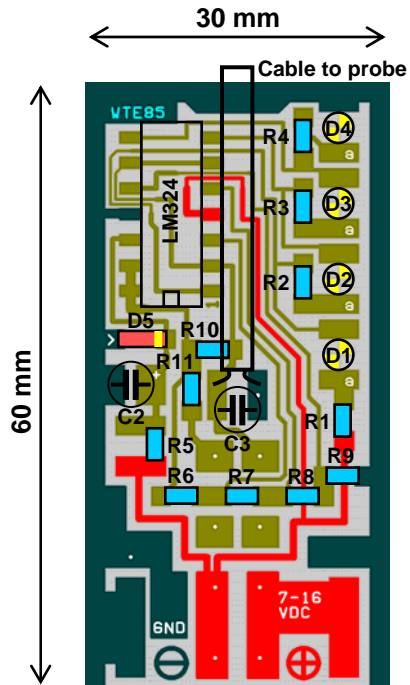
Circuit diagram for a simple water detector



Tested

WTE85

Placing of components



COMPONENTS:

R1-R11	1206, SMD
C2	E-lytic, PCB/SMD
C3	SMD/PCB
D1-D4	3 mm LED
D5	BZV55-B5V6, SMD
LM324	Quad-OP, PCB
On Switch	E;kit: 41001412

FRONT



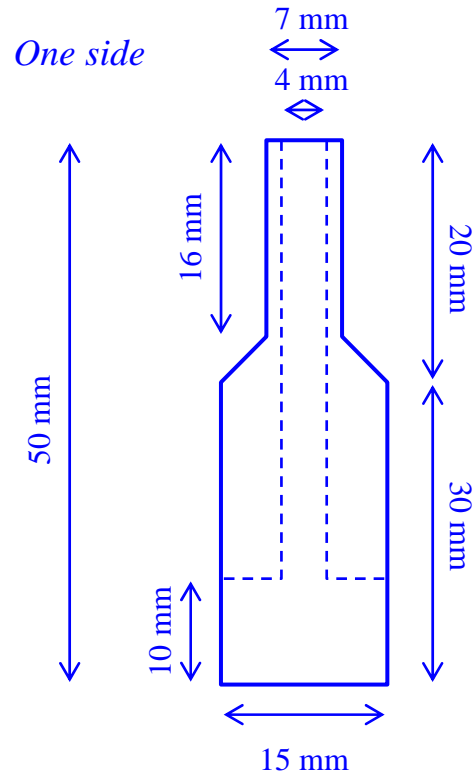
Drill 3 mm holes through the board and slide the LED's in them.



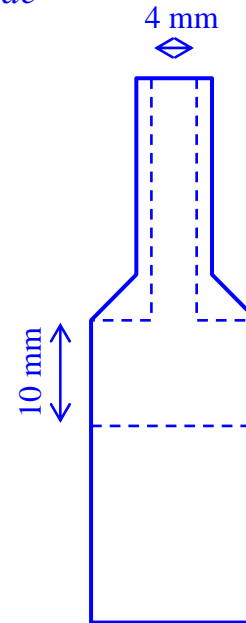
EP-M

*Conductivity Probe
for WTE85*

EP-M



Next side



Flexible Conductive Meter	<u>Fcm22</u>	A-2	2010-05	B. Lindqvist	
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This is another version and here we can talk about a conductivity meter. Fcm22 is a bit larger than WTE85 but can be (in this context) called portable. Fcm22 allows a fairly accurate analysis of any fluid and with a long cable for the probe you can also measure through the filling tube of a car.

Fcm22 is designed with minimal resource requirements without compromising on quality. There are four different ranges. You can quickly determine the range through the LED's - which of the two that shine. Lights "LESS"; you must choose a low range but lights "MORE"; requires a high range. The fine-tuning is done with the hex coded switch until the LED changes.

Then Fcm22 working with alternating current (a square wave) it is preferable to use with a shielded cable. Therefore I believe that a 75-ohm TV cable fits pretty well. Since the measuring of resistance lies in the mega ohm area will even a small capacitance in the probe causing a significant resistance error. It is therefore important to compensate this capacitance - this is done with Cco.

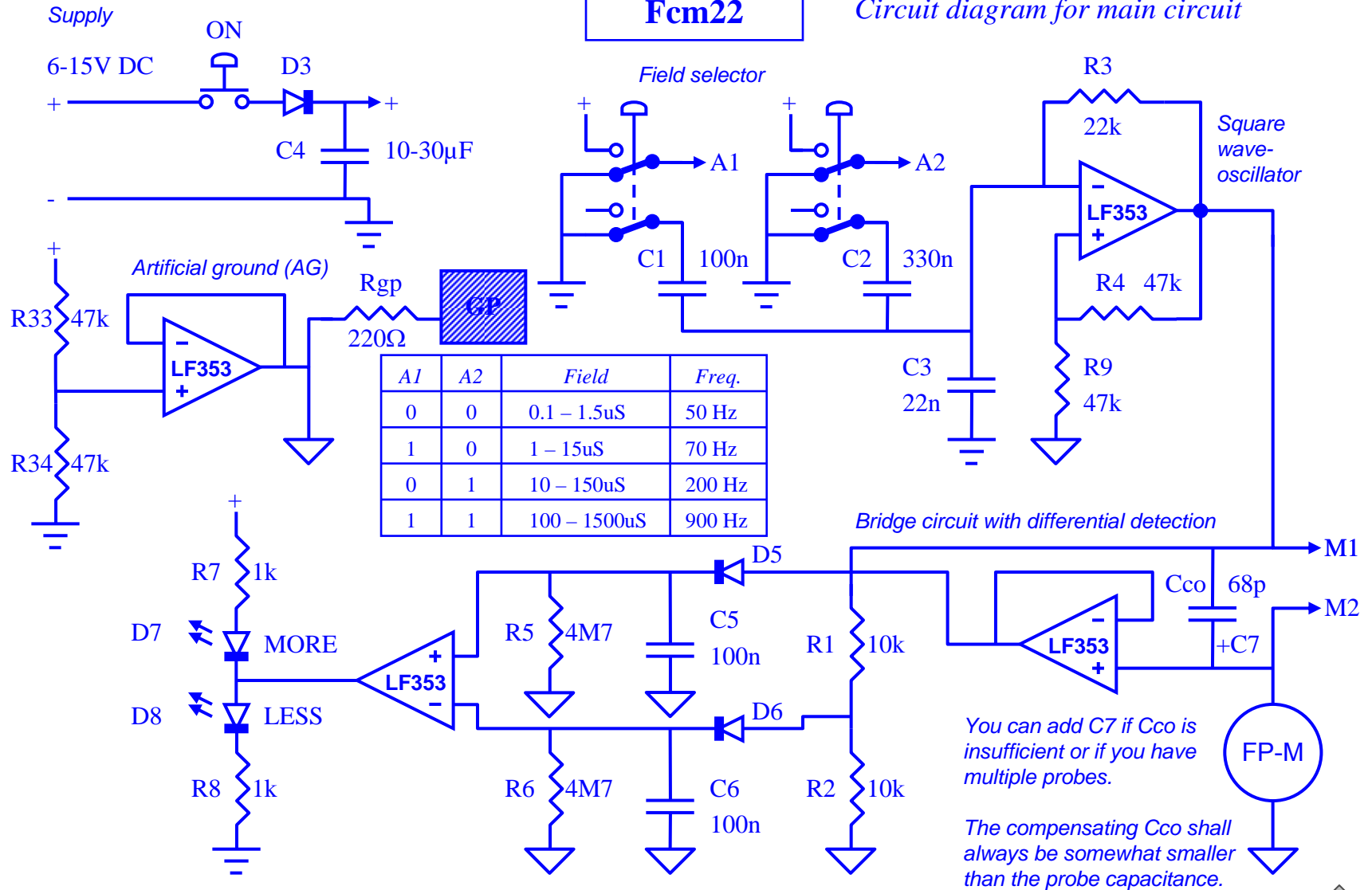
It is important that Cco always compensate the probe capacitance, especially when measuring small conductance's (high resistance). For a correct compensated probe light "MORE" (the red LED), but only at 0 - not for higher values.

The underside of Fcm22 (and even WTE85) may consist of a bent sheet metal covers. Please use the plate from EMU. EMU is a tin box from IKEA, which has a high surface finish and is also solderable.

<i>Board type</i>	Double sided	<i>Technique</i>	Based on SMD	<i>EMI</i>	Yes	<i>Supply</i>	6 - 15 VDC
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Fcm22

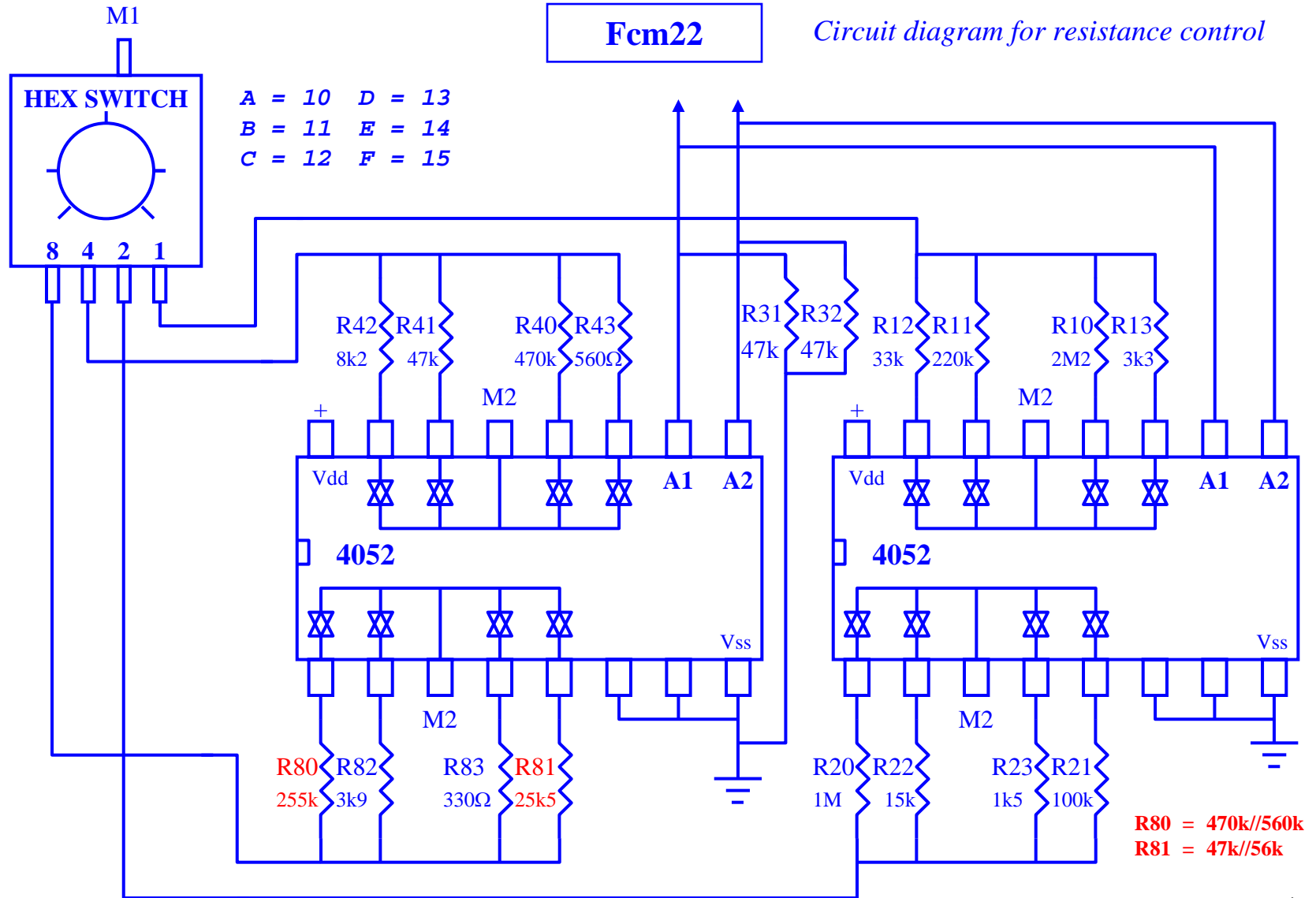
Circuit diagram for main circuit



Tested

Fcm22

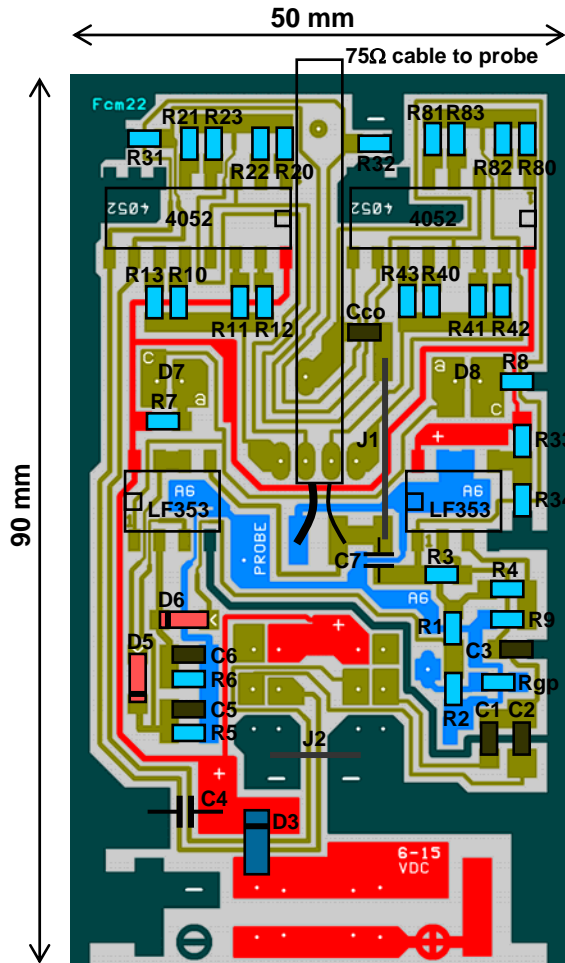
Circuit diagram for resistance control



Tested

Fcm22

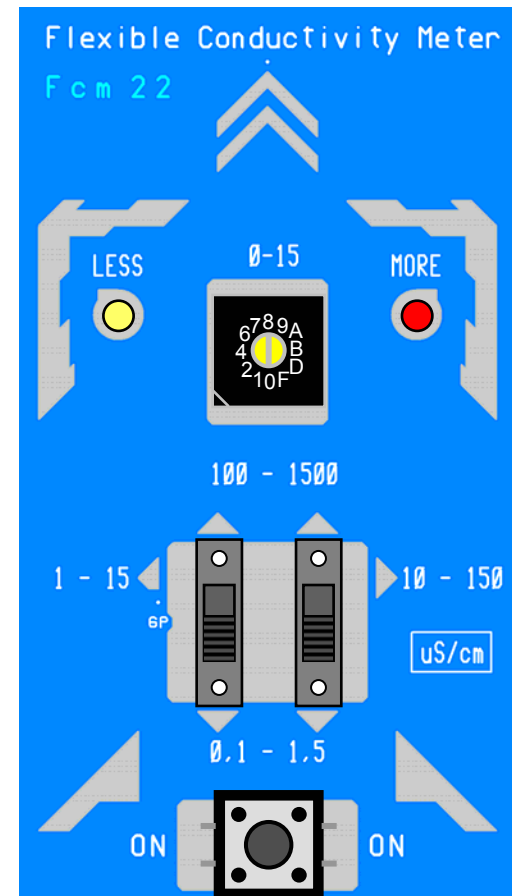
Placing of components



COMPONENTS:

R1-R83	1206, SMD
Rgp	1206, SMD
C1-C3	1206, SMD
C4	E-lytic, PCB/SMD
C5&C6	1206, SMD
Cco	1206, SMD
C7	PCB/SMD
D3	LL5817, SMD
D5&D6	BAS32
D7&D8	3 mm LED
LF353	2x Fet-OP, PCB
4052	2x Logic, PCB
Hex Switch	<i>Elfa: 135-30-257</i>
Field Selector	<i>2x Elfa: 135-11-182</i>
On Switch	<i>E;kit: 41003910</i>
J1	Jumper 1
J2	Jumper 2

FRONT



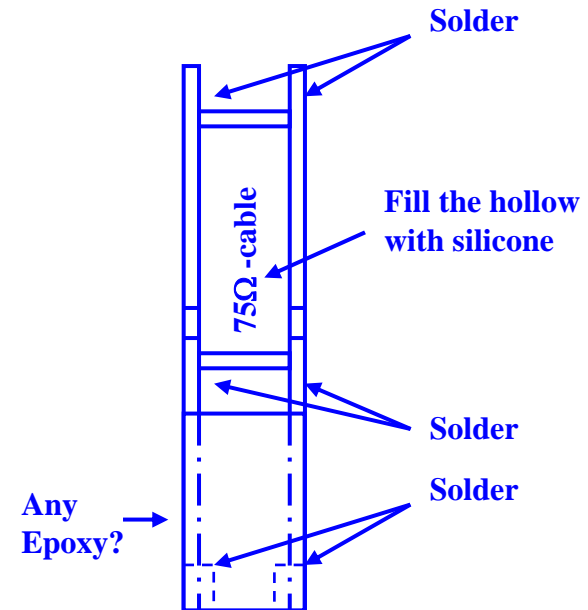
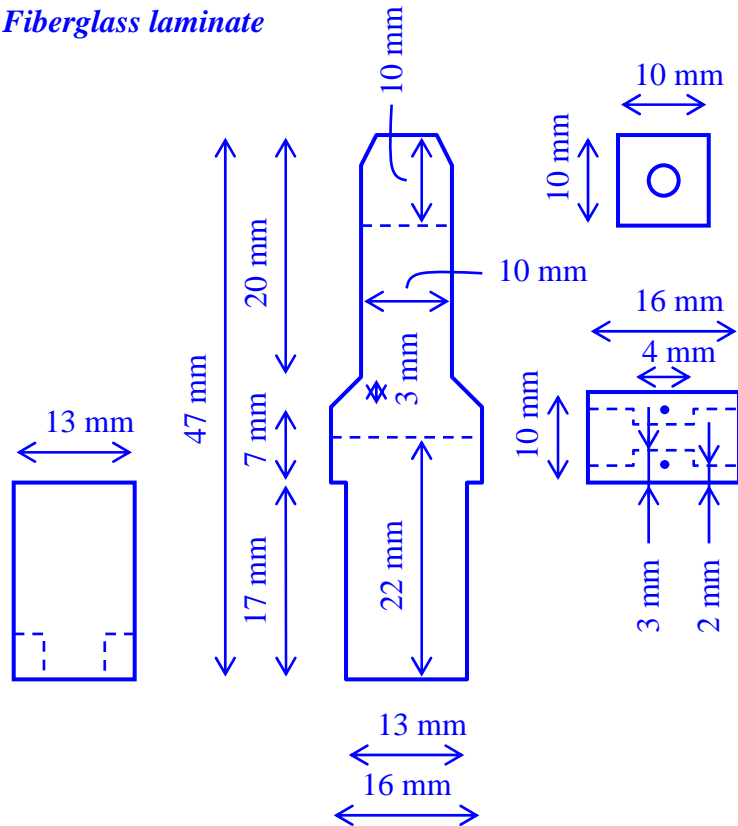
Tested

FP-M

*Conductivity Probe
for Fcm22*

FP-M

*1.5 mm
Fiberglass laminate*



**Cover all the surface
of copper with solder**

*The length of 75 ohm cable: 120 cm
- gives ~80 pF*

Fcm22

