



# Protection Board

## PB-10; PB-20

### Top View



**PB-10**  
Size:  
219.7 mm x 21.6 mm  
(8,65" x 0,9")



**PB-20**  
Size:  
124.5 mm x 21.6 mm  
(4,9" x 0,9")

### General Description

Protection board has two functions. First one is to adopt the chamber anode wire terminals to the anode amplifier board inputs. The second function is to protect the amplifier inputs against large input charge.

PB is designed to install on the chamber plane carrying anode wires on both sides (anode plate) and collected 8 channels from each side.

There are two modifications of the protection boards designed, the first one is for 10 degree chambers PB-10 and the second - for 20 degree chambers PB-20.

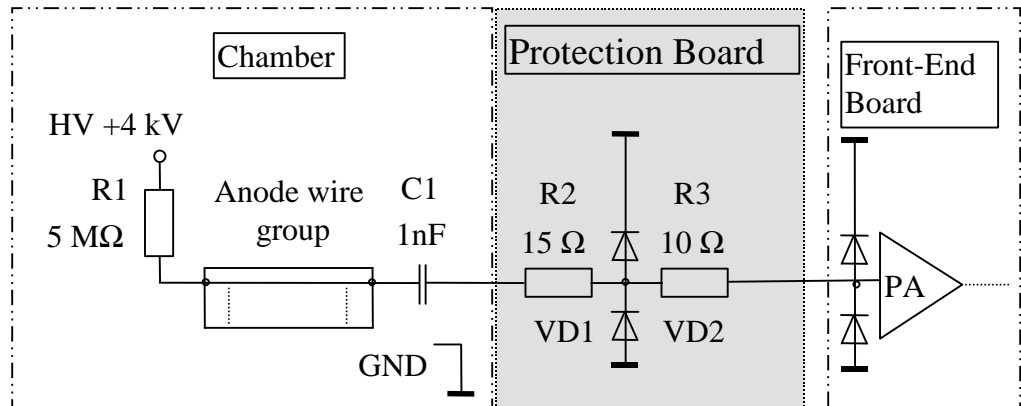
### Features

Sixteen spread inputs (8+8) are traced into a standard 34 pin connector.

PB provides a proper ground connection of the amplifier input to the chamber signal ground.

Resistor/diode/resistor protection network protects surely each amplifier input against electrical discharge of 1000 pF capacitor charged up to 5 kV.

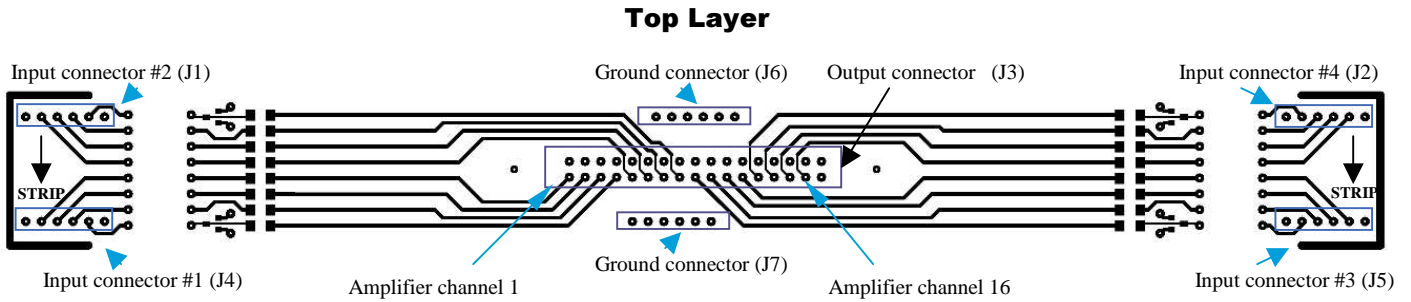
### Protection Circuit Structure



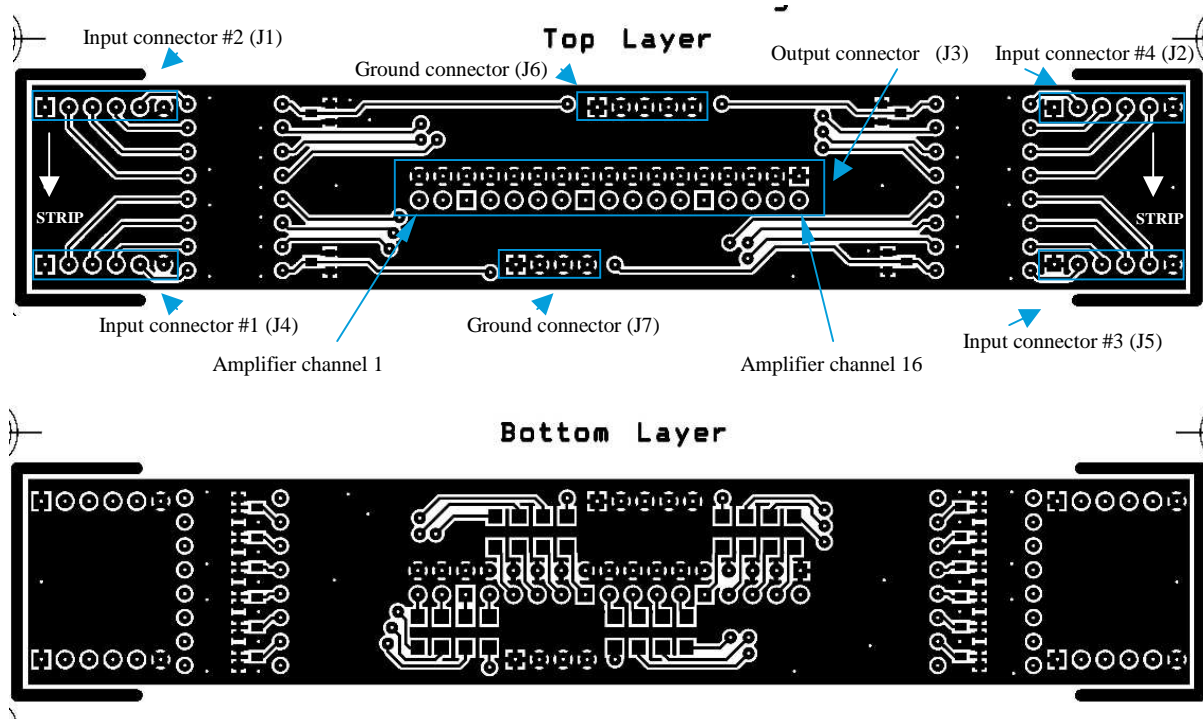
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**PB-10; PB-20**

## Layout PB10



## Layout PB20



## Protection Board

**PB-10; PB-20**

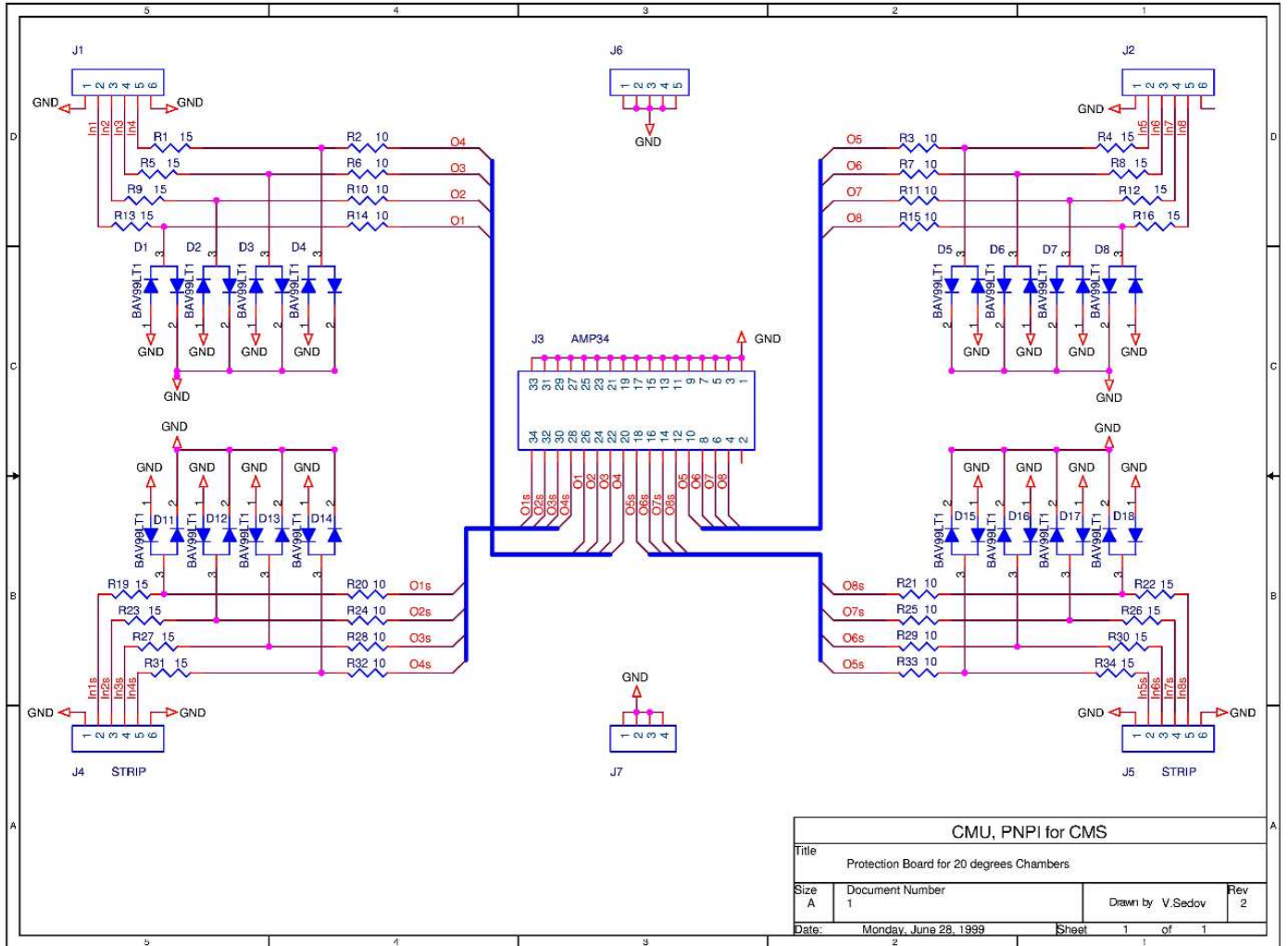
### Electrical Characteristics

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Through resistance	Rc			25		Ohm
Protection quality		Average number of sparks before amplifier failure. Sparc to ground of 1 nf capacitor charged up to 5 kV.	100,000			spark
Reliability		Spark to ground of 2nF capacitor charged up to 7 kV	100,000			spark

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### Schematic Diagram



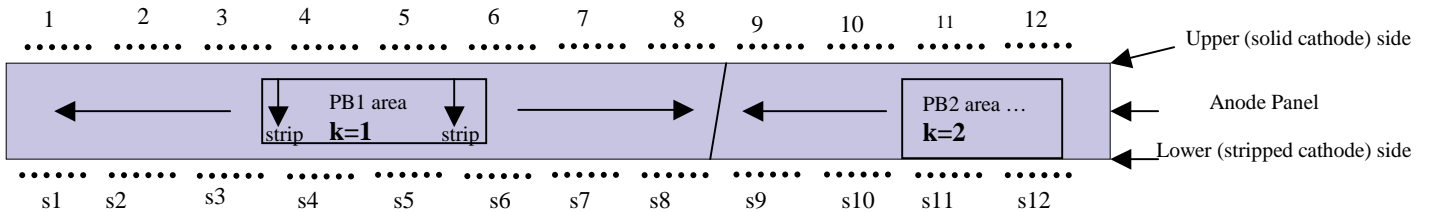
R1, R4, R5, R8, R9, R12, R13, R16, R19, R22, R23, R26, R27, R30, R31, R34 – 15 Ohm, 0.25 W Carbon Composition  
 R2, R3, R6, R7, R10, R11, R14, R15, R20, R21, R24, R25, R28, R29, R32, R33 – 10 Ohm 0.25W SM  
 D1, D2, D3, D4, D5, D6, D7, D8, D11, D12, D13, D14, D15 < D16, D17, D18 – BAV99LT1

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### Application note

The protection board connected to the Anode Panel (AP) of CSC collects 8 anode channels from upper side and 8 from lower side of the AP. Arrow and word “STRIP” shows that this side of PB must be connected to the stripped side of AP. This side is a lower side of the AP.



AFEB channels mapping.

#	AFEB channel number	PB output connector address	PB input connector address	Anode wire groupe address; k=1	Anode wire groupe address; k=2	Anode wire groupe address	
1	1	J3- 34	J4- 2	s1	s9	s1+(k-1)8	
2	2	J3- 32	J4- 3	s2	s10	s2+(k-1)8	
3	3	J3- 30	J4- 4	s3	s11	s3+(k-1)8	
4	4	J3- 28	J4- 5	s4	s12	s4+(k-1)8	
5	5	J3- 26	J1- 2	1	9	1+(k-1)8	
6	6	J3- 24	J1- 3	2	10	2+(k-1)8	
7	7	J3- 22	J1- 4	3	11	3+(k-1)8	
8	8	J3- 20	J1- 5	4	12	4+(k-1)8	
9	9	J3- 18	J5- 2	s5	s13	s5+(k-1)8	
10	10	J3- 16	J5- 3	s6	s14	s6+(k-1)8	
11	11	J3- 14	J5- 4	s7	s15	s7+(k-1)8	
12	12	J3- 12	J5- 5	s8	s16	s8+(k-1)8	
13	13	J3- 10	J2- 2	5	13	5+(k-1)8	
14	14	J3- 8	J2- 3	6	14	6+(k-1)8	
15	15	J3- 6	J2- 4	7	15	7+(k-1)8	
16	16	J3- 4	J2- 5	8	16	8+(k-1)8	

Note: k – Protection Board number along the Anode Panel from narrow side of the chamber to wide side.