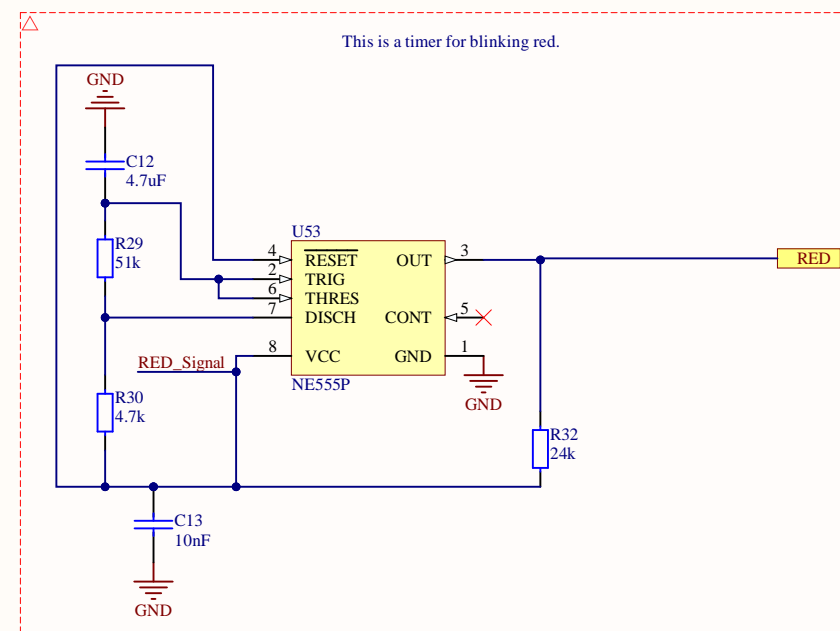


GREEN\_SIGNAL GREEN



# **TSAL\_Main\_Board**

Size: A4

Car#: 100

Team: BRT

Date:

Time:

Sheet 2 of 3

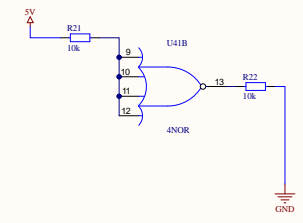
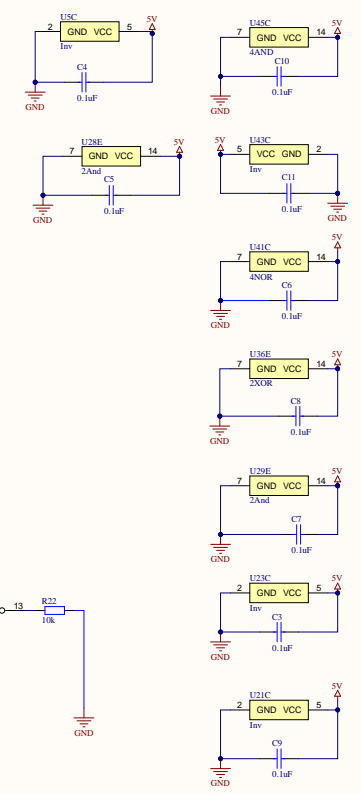
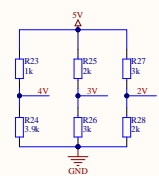
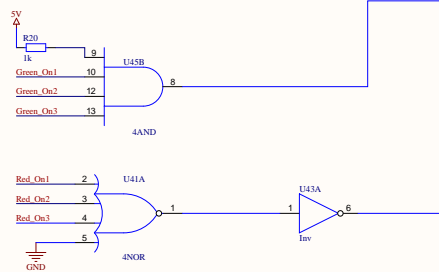
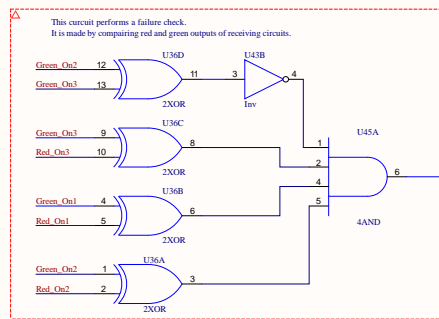
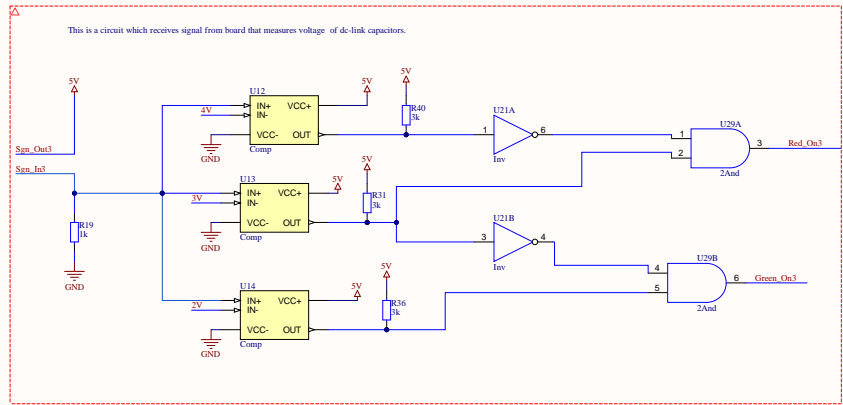
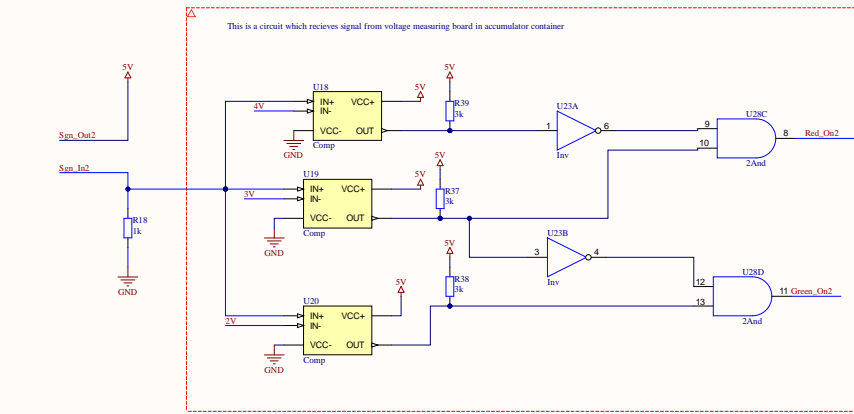
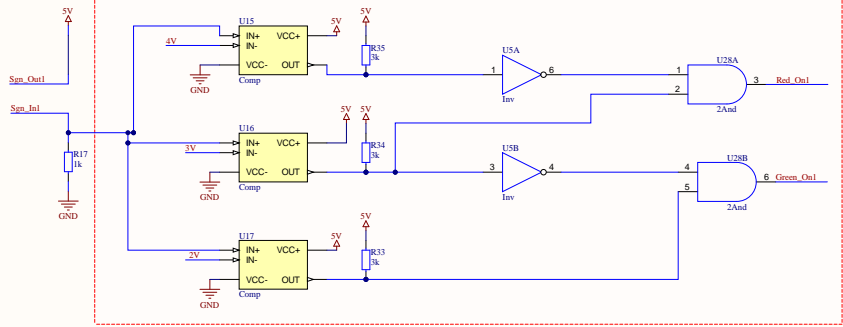
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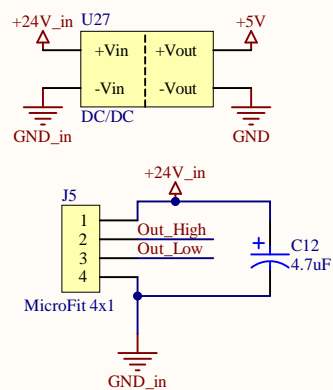
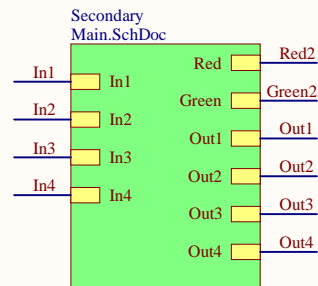
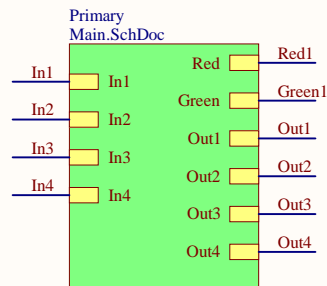
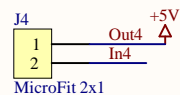
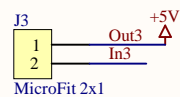
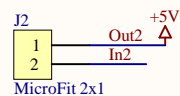
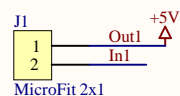
University:

Bauman Moscow State

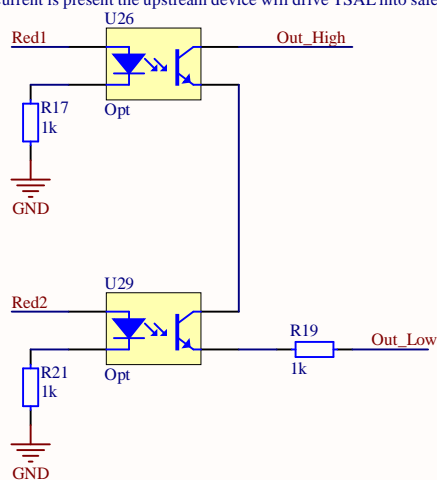
Technical University



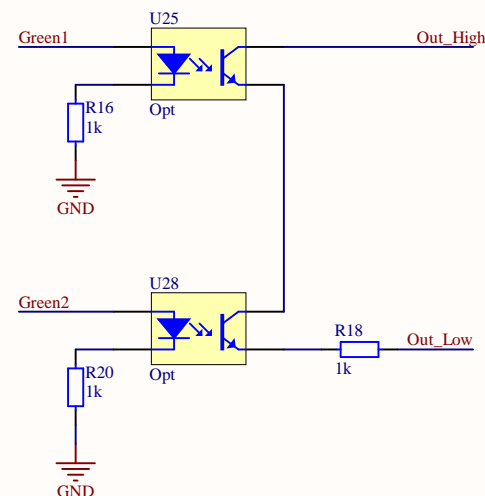




△ This optical couples connect 1 kOhm resistor to the board input if voltage does not exceed 60V. Each optical couple is driven by a separate detection scheme so if one the schemes is broken the board wouldn't send a wrong signal. If no path for current is present the upstream device will drive TSAL into safe state.



△ This optical couples connect 2.4 kOhm resistor to the board input if voltage exceeds 60V. Each optical couple is driven by a separate detection scheme so if one the schemes is broken If no path for current is present the upstream device will drive TSAL into safe state.



### Relay State detection board

Size: A4

Car#: 100

Team: BRT

Date:

Time:

Sheet 1 of 3

Document Version:

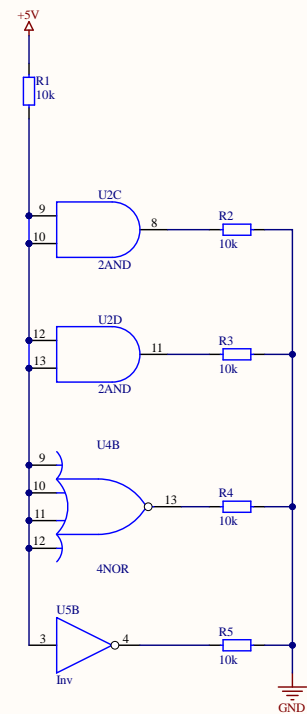
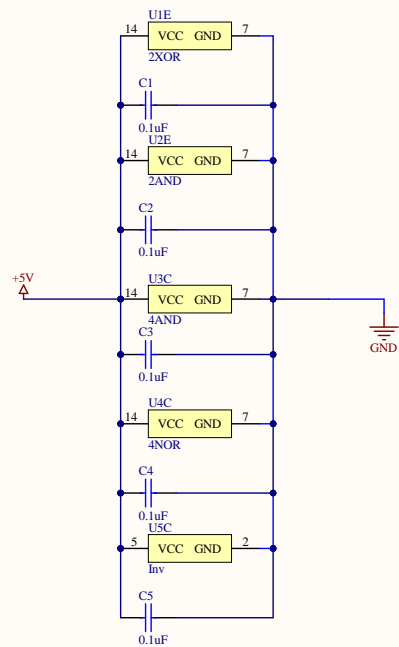
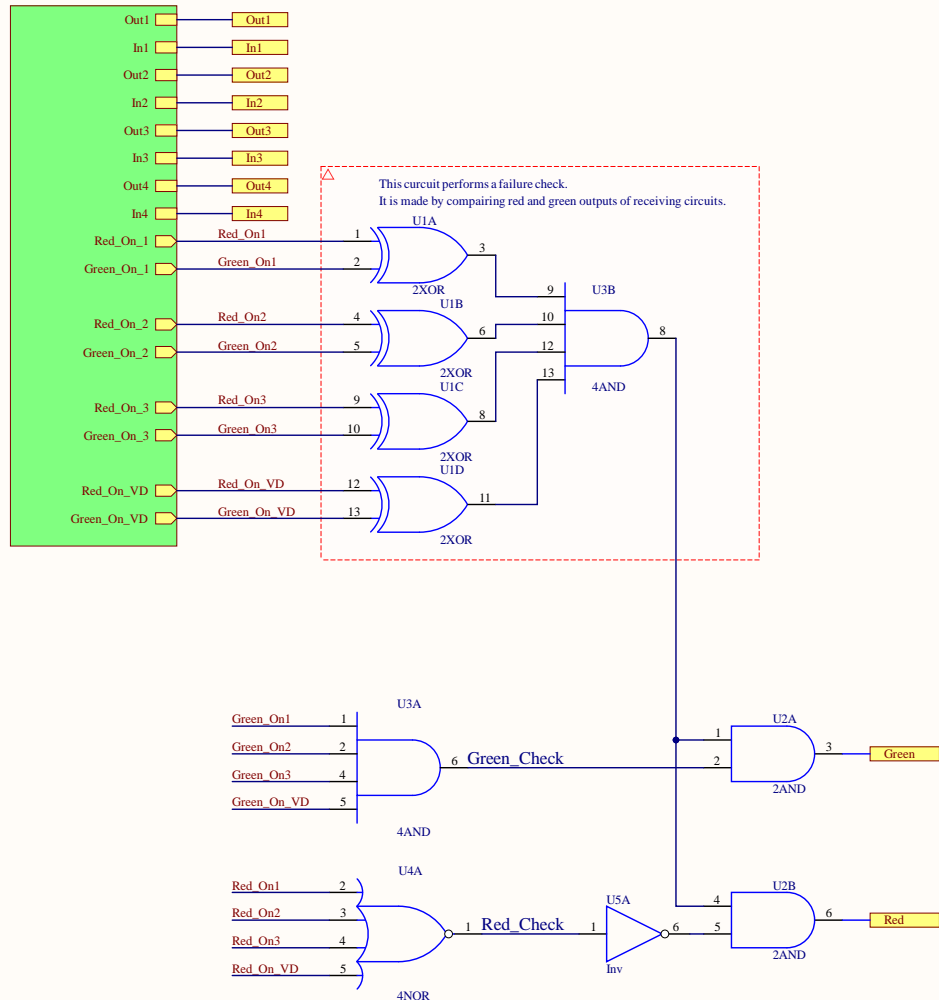
University:

Bauman Moscow State

Technical University



Detection



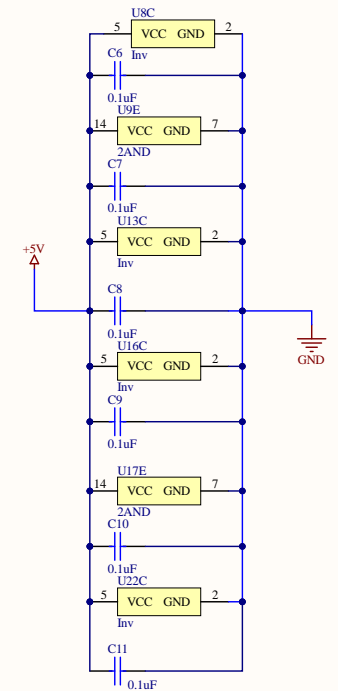
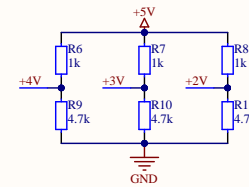
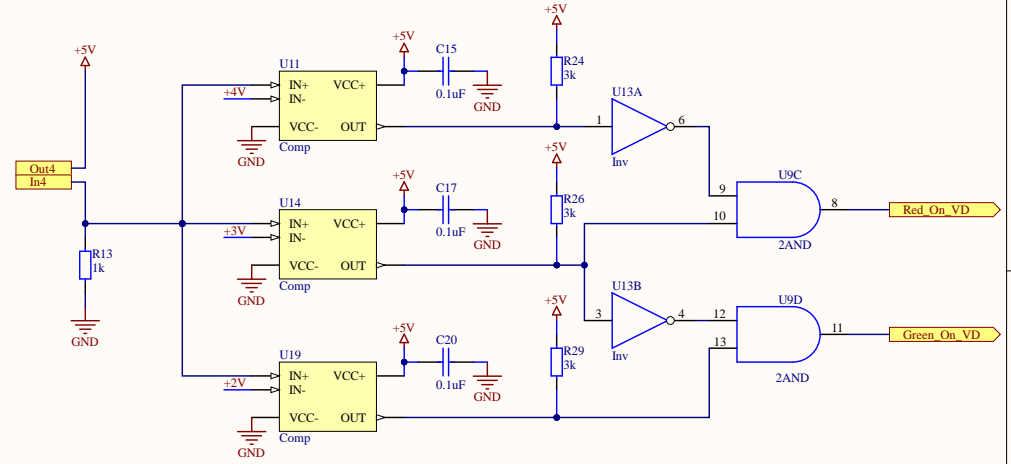
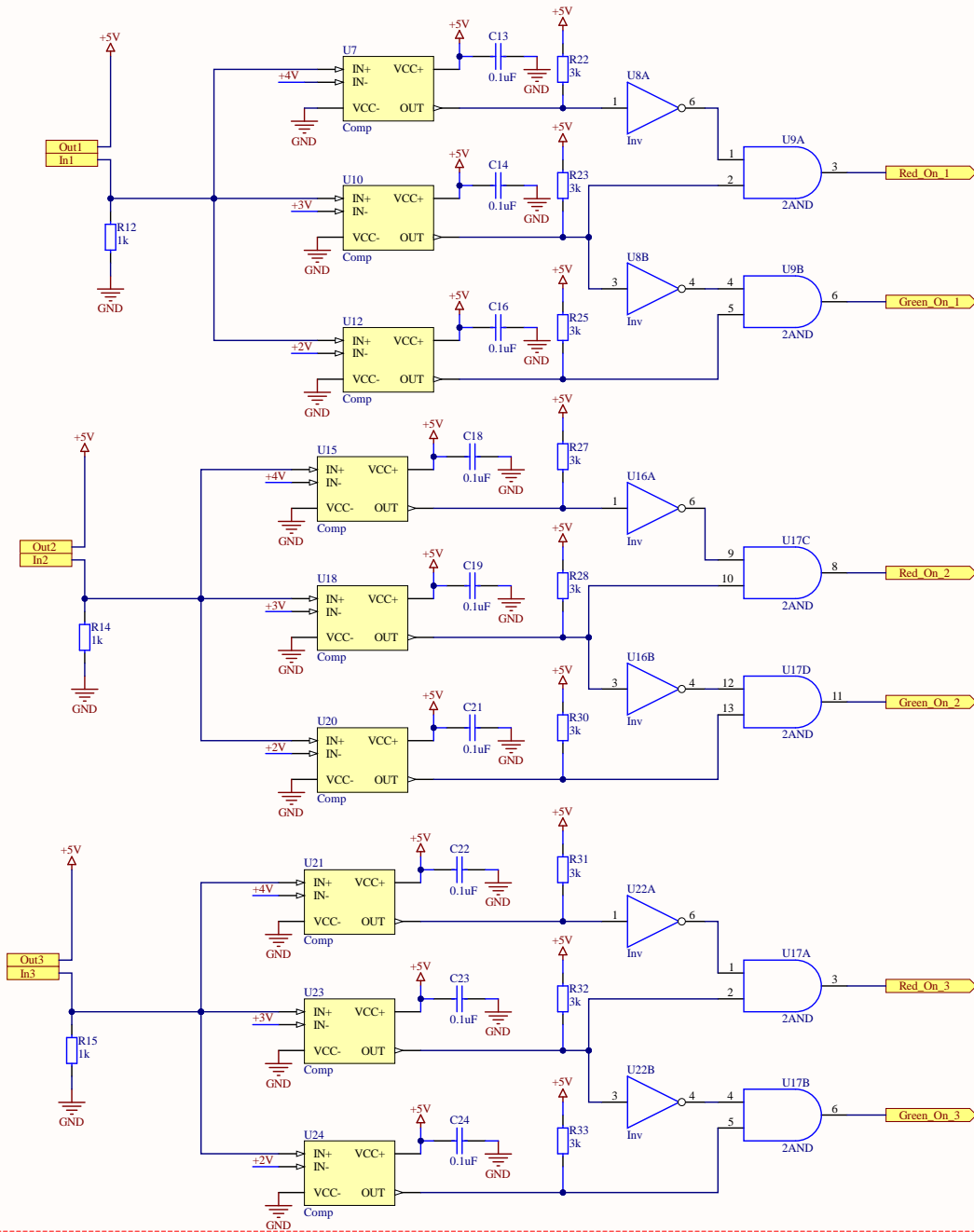
**Relay State detection board**

Size: A3 Car#: 100 Team: BRT  
Date: Time: Sheet 2 of 3  
Document Version: 1

University:  
Bauman Moscow State  
Technical University



This schemes detect the state of AIR+, AIR- and precharge relay. We will provide the schematic of relay connection.  
It incorporates short circuit detection as well as wire failure detection



# Relay State detection board

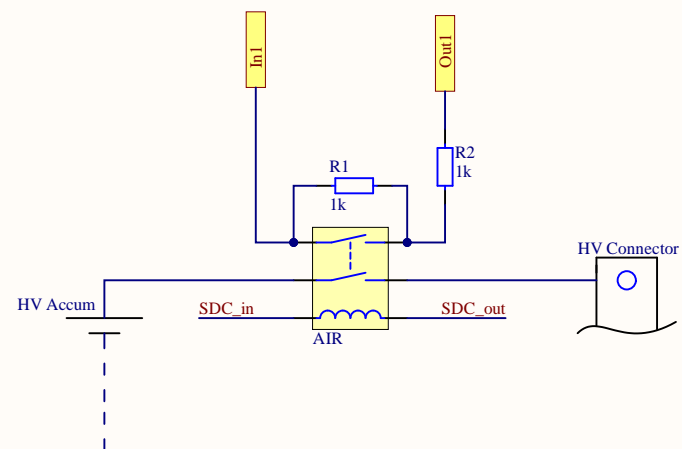
Size: A3  
Date: Document Version: 1


Car#: 100  
Time: Sheet 3 of 3

Team: BRT

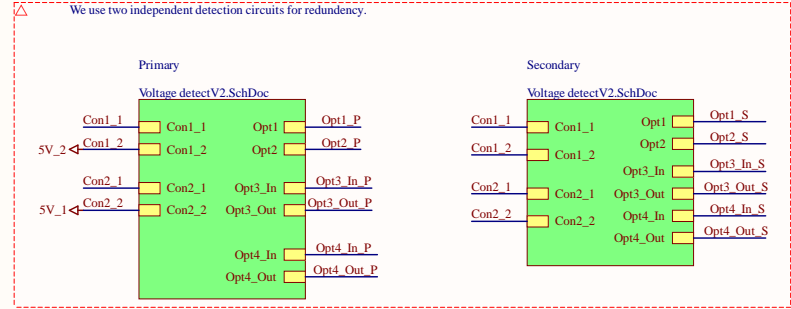
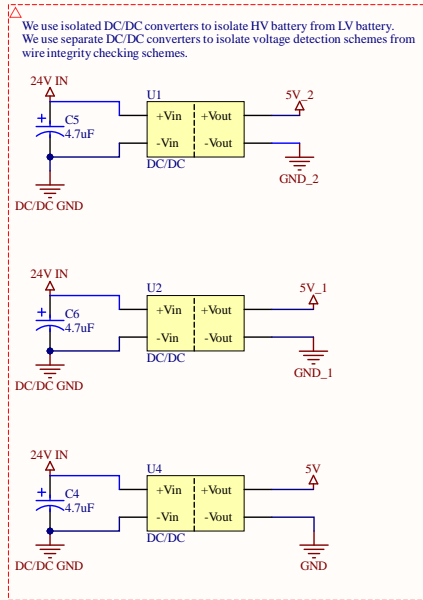
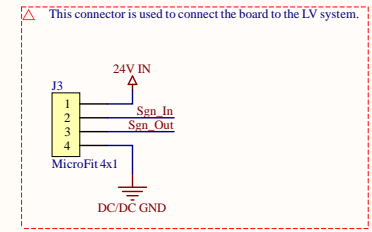
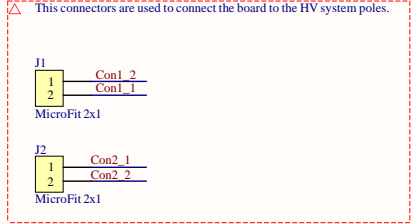
University:  
Bauman Moscow State  
Technical University





<b>Relay connection</b>			University:	 bauman racing team
Size: A4	Car#: 100	Team: BRT	Bauman Moscow State	
Date:	Time:	Sheet 1 of 1	Technical University	
Document Version: 1				

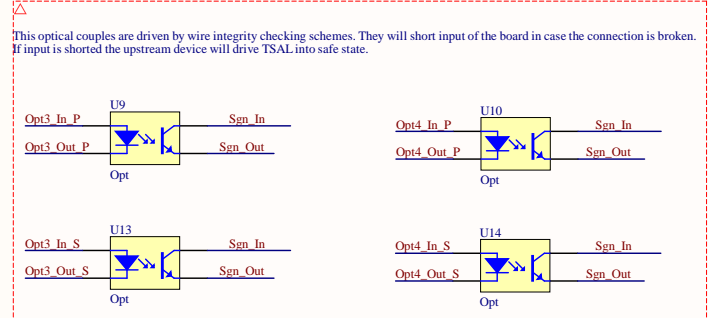
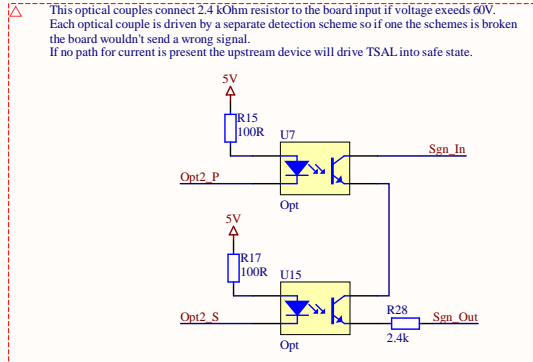
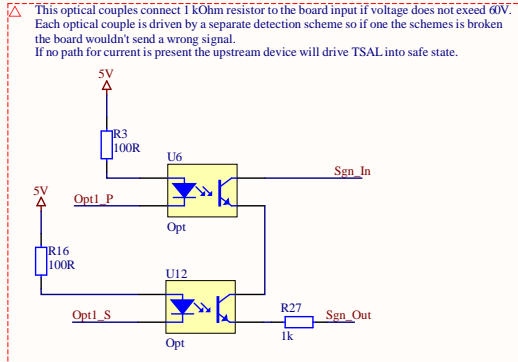
A



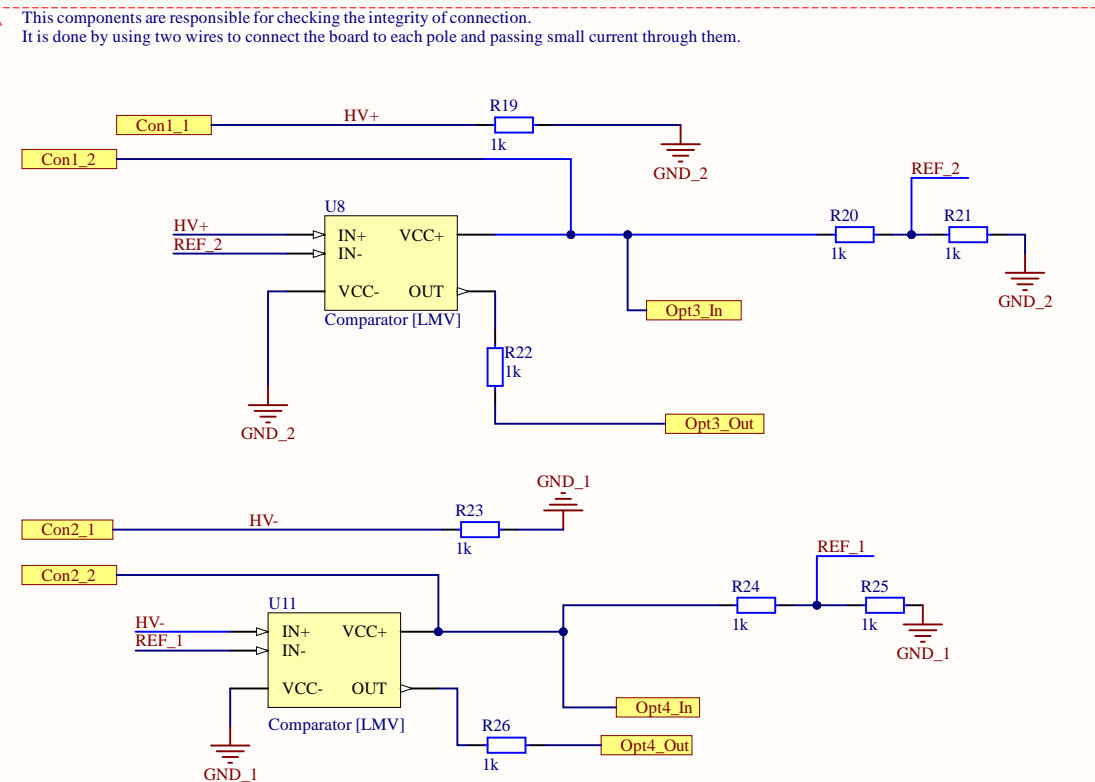
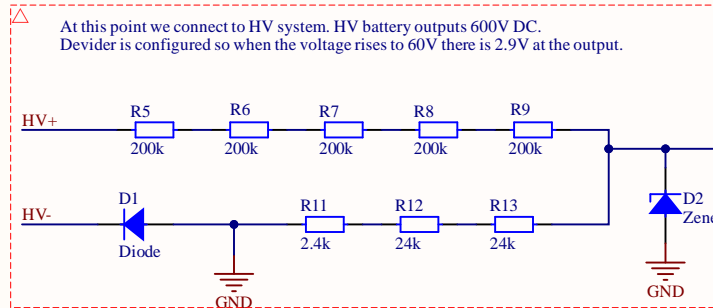
B

C

D







### Voltage measuring board

Size: A4	Car#: 100	Team: BRT
Date:	Time:	Sheet2 of 2
Document Version:		

University:  
Bauman Moscow State  
Technical University



A

B

C

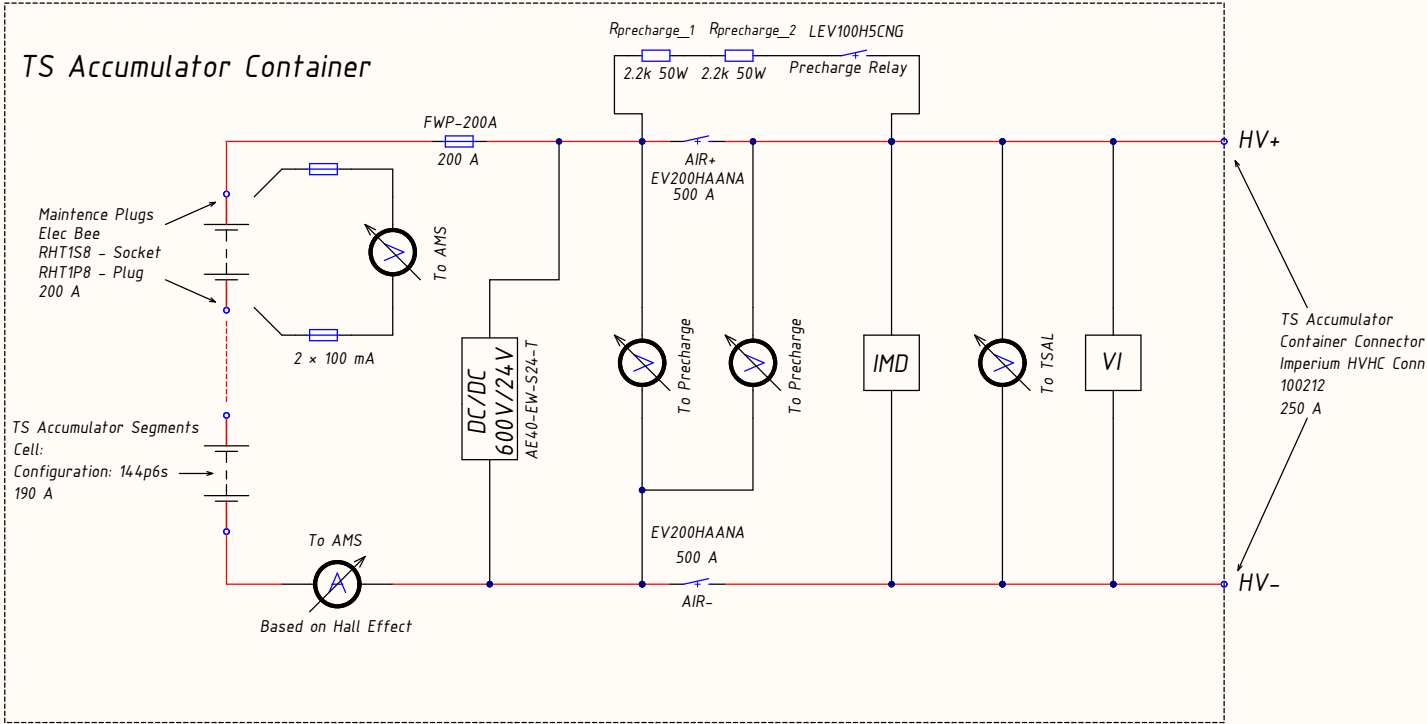
D

A

B

C

D



**TSAL voltage measuring points**

Size: A3	Car#: 100	Team: BRT
Date:	Time:	Sheet 1 of 2
Document Version: 1		

Univercity:  
Bauman Moscow State  
Technical University



1

2

3

4

5

6

7

8

