



# Resetting the RPC rack

(first clear any Gas Shack alarms that might exist)

To reset a trip:

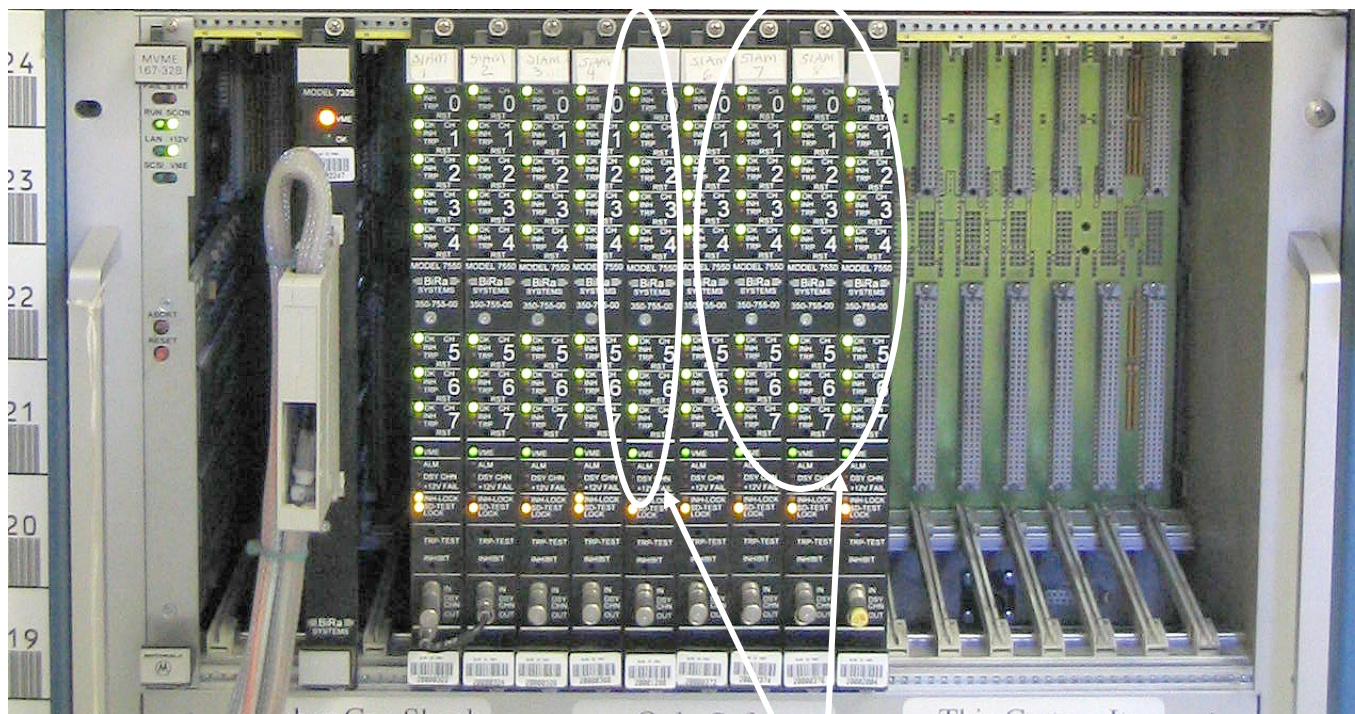
1. Push Disable
2. Use the red reset buttons to reset the faults
3. Reset the SIAMs in the safety rack (next page)
4. Push Enable



A 'Mixed Gas Output Flow Fault' could require you to turn the 'Output Flow Override' key temporarily to reset the fault  
Important: when the RPC gas system trips, this will shut off the RPC isobutane supply.

# The SI AMs in the gas shack VME crate (rack B636-03)

SIAM: 1 2 3 4 5 6 7 8 9



This is where you look to clear the RPC SIAMs manually by pushing the reset button (RST); note that SIAM 5 will shut off the RPC isobutane

SIAM	
<input type="radio"/> OK	CH 0
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 1
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 2
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 3
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 4
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
MODEL 7550	
≡ BiRa ≡ SYSTEMS	
350-755-00	
<input type="radio"/> OK	CH 5
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 6
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> OK	CH 7
<input type="radio"/> INH	
<input type="radio"/> TRP	
<input checked="" type="radio"/> RST	
<input type="radio"/> VME	
<input type="radio"/> ALM	
<input type="radio"/> DSY CHN	
<input type="radio"/> +12V FAIL	
<input type="radio"/> INH - LOCK	
<input type="radio"/> SD - TEST	
<input type="radio"/> LOCK	
<input checked="" type="radio"/> TRP TEST	
<input checked="" type="radio"/> INHIBIT	
<input checked="" type="radio"/> IN	
<input checked="" type="radio"/> DSY CHN	
<input checked="" type="radio"/> OUT	

Reset



If these steps don't work, check that the ventilation system and the HAD system are up and running, the RPC valves are enabled, and that only the internal RPC system trips are stopping the RPC gas flow. (Look at the Gas Shack Safety Rack B636-03.)

To verify this, check rack B636-03; look at SIAMS 1-5. If only SIAM 5 has red TRP lights on, you can be certain that it is an internal RPC trip. All of the valves controlled by Panels 125-945 and 125-962 should be enabled and powered except for the RPC isobutane. The RPC isobutane valves should both be enabled. Panel 125-945 should show only a Group 5 fault (RPC system).

If channel 5 of SIAM 5 is tripped, it will need to be put into bypass. To do this, push the SIAM 5 inhibit button at the bottom and the channel 5 RST button at the same time. The orange INH light should turn on. Once the isobutane flow is enabled, the isobutane pressure in the line should build up, and the input should revert to normal.

A 'MIXED GAS OUTPUT FLOW FAULT' could require the key for the 'OUTPUT FLOW OVERRIDE' on the RPC mixer to be turned horizontally so the fault can be cleared long enough to get a fill begun. This usually happens if the pressure in the buffer tank has gotten extremely low. Return the key to the vertical position when done.

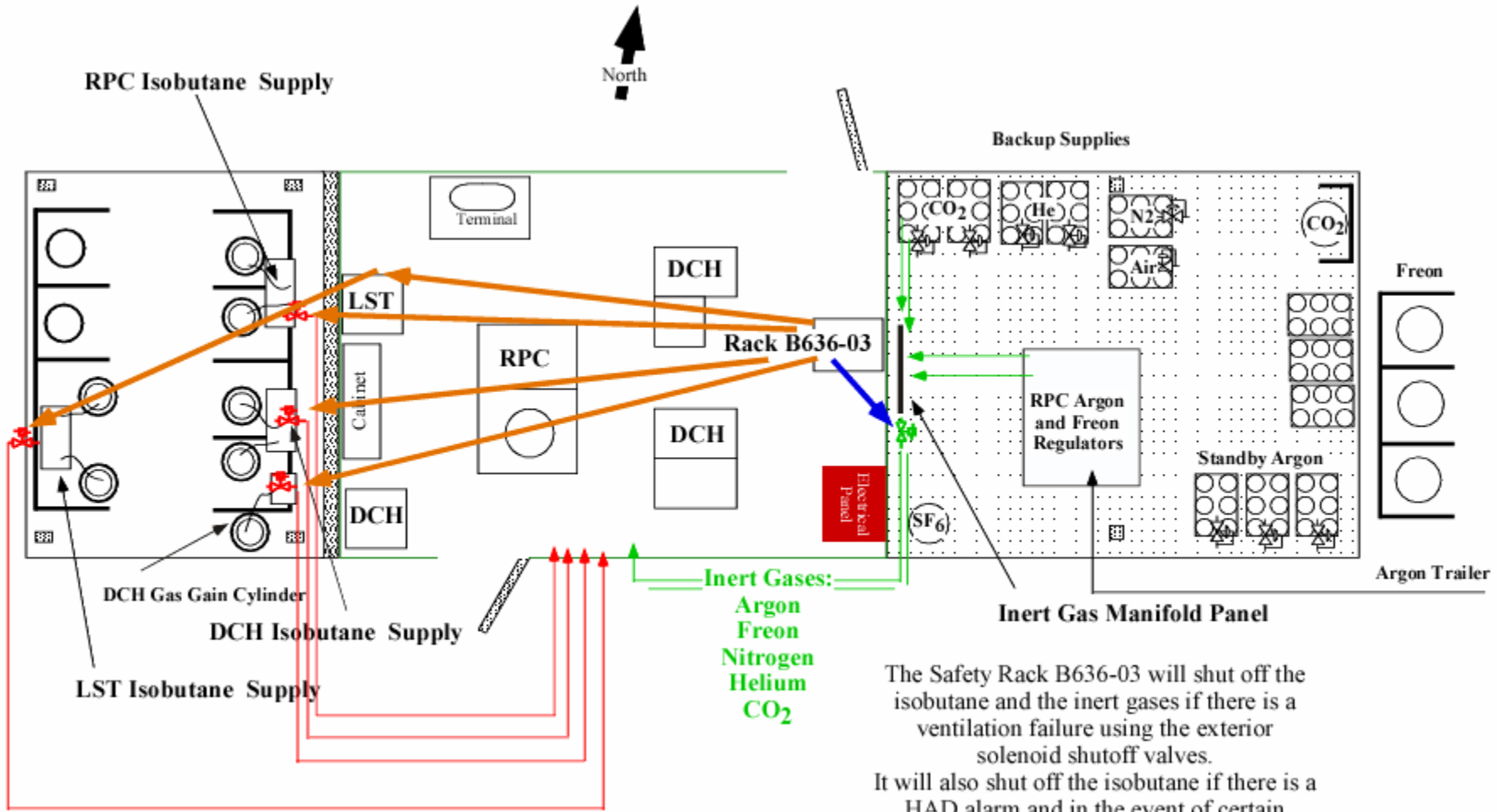
The last RPC device that could trip off the system is the sensor monitoring the ventilation fan for the RPC mixing rack itself. The sensor makes certain that there is enough ventilation going into the rack to prevent a buildup of isobutane inside the rack were there to be a leak there. The signal from this sensor goes to channel 0 of SIAM 4; Panel 125-945 will show a Group 3 Fault. If the fan fails, one needs to remove the back door to the RPC mixing system to provide rack ventilation and to call an expert to physically bypass the sensor until the fan can be repaired. This particular channel cannot be bypassed.

Inhibit



The system will have about a minute or two to start a fill. The system may trip at the end of this period because pressures and flows have not reached equilibrium. If so, repeat the process. Clear any inhibited channels when done.

When the RPC gas system trips, this will cause the safety system to shut off the RPC isobutane supply using the exterior solenoid valves.



The Safety Rack B636-03 will shut off the isobutane and the inert gases if there is a ventilation failure using the exterior solenoid shutoff valves. It will also shut off the isobutane if there is a HAD alarm and in the event of certain system trips.

# Gas Shack SIAM contents (1)

SIAMs 1-4 contain information on the status of the ventilation, the gas shack HADs, a gas shack smoke detector, and DCH monitors

SIAM 4, channel 0 monitors the ventilation in the RPC rack; it will shut off the RPC isobutane if the fans fail

SIAM 1	
0	MFI - Air Intake
1	MFS - Air Supply
2	MFR - Air Return
3	MFE - Air Exhaust
4	
5	
6	
7	Smoke Det

SIAM 3	
0	DCH Iso VLow
1	DCH Est Low
2	DCH Solv Low
3	DCH Solv Hi
4	HAD 9 - front bulkhead vent
5	HAD 10 - rear bulkhead vent
6	HAD 11 - rack 10 top
7	HAD 12 - rack 10 bottom

SIAM 2	
0	HAD 1
1	HAD 2
2	HAD 3
3	HAD 4
4	HAD 5
5	HAD 6
6	HAD 7
7	HAD 8

SIAM 4	
0	MFB - RPC Rack Ventilation
1	DCH Sys Problem
2	IR-2 (in)
3	IR-2 Crash
4	
5	
6	
7	



# Gas Shack SIAM contents (2)

SIAM 5	
0	RPC: Input Pressure Fault
1	RPC: Input Flow Fault
2	RPC: Mixing Tank Pressure High
3	RPC: Mixed Gas Output Flow Fault
4	RPC: Ext Mixed Gas Output Interlock
5	RPC iso Vlow
6	
7	

These will shut off the RPC isobutane

Channels 0-4 come from the gas mixing system

Channel 5 monitors a pressure switch in the RPC isobutane supply line

SIAM 6	
0	RPC: Ext Fill Interlock
1	RPC: Fill Operation Fault
2	
3	24V Supply OK
4	HAD 6-8 Bypass (tank change)
5	LST 24V Supply OK
6	LST System SO
7	LST Isobutane Vlow Fault

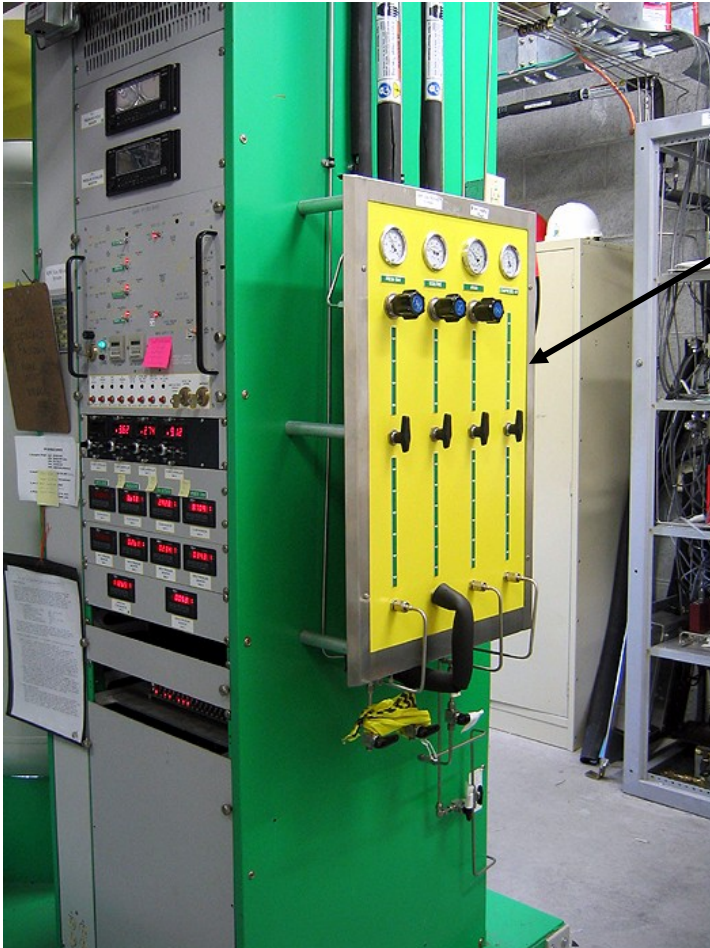
SIAM 8	
0	DCH Isobutane - VVS01
1	DCH Isobutane - VVS02
2	RPC isobutane - VVS03
3	RPC isobutane - VVS04
4	Span Gas - VVS05
5	Span Gas - VVS06
6	LST Isobutane - VVS013
7	LST Isobutane - VVS014

Status Indicators

SIAM 7	
0	RPC: Isobutane low
1	DCH Isobutane low
2	RPC: Argon low
3	RPC: Freon low
4	DCH Helium low
5	DCH Nitrogen low
6	Compressed Air low
7	DCH CO2 low

SIAM 9	
0	RPC Argon - VVS07
1	DCH Nitrogen - VVS08
2	DCH Helium - VVS09
3	RPC Freon - VVS10
4	DCH CO2 - VVS11
5	VVS012
6	LST Argon - VVS015
7	LST CO2 - VVS016

## RPC gas mixing station – side view



This panel provides the interior connections for the three RPC gases to the mixer, plus instrument air to operate the valves, with their regulators.

The freon and isobutane lines are heated and insulated.

You can check to see whether there is sufficient supply pressure for the gases here. The pressure reading depends on whether or not a fill is in progress.

Freon: 37 psi (41 psi standby)

Argon: 30 psi (32 psi standby)

Isobutane: 24 psi (24.1 psi standby)

Air: ~ 85 psi

## RPC gas mixing station – side view



The yellow 'post-it' notes give the normal pressure ranges

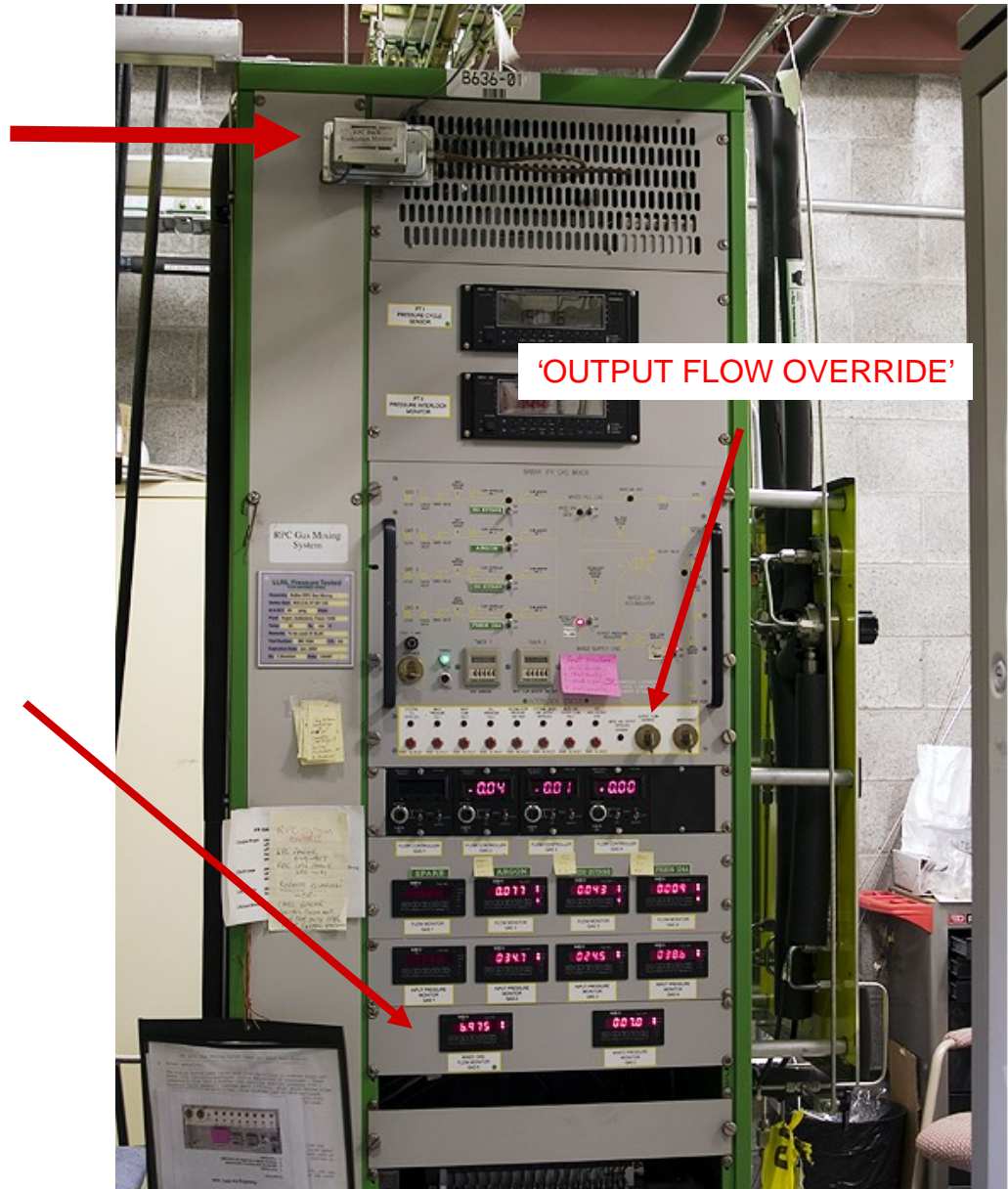
You can check to see whether there is sufficient supply pressure for the gases here. The pressure reading depends on whether a fill is in progress or the mixer is on between fills.

Freon: 37 psi (41 psi standby)  
Argon: 30 psi (32 psi standby)  
Isobutane: 24 psi (24.1 psi standby)  
Air: ~ 85 psi

# RPC gas mixing station – front view

This is a ventilation sensor called **MH6**; it checks whether the fan in the RPC rack is running. If the fan stops (or someone blocks the sensor) it will shut off the RPC isobutane. This will show up as a fault in SIAM 4, channel 0

This is the monitor that generates a 'MIXED GAS OUTPUT FLOW FAULT.' If the pressure in the buffer tank gets so low that the output flow to IR2 is affected, this sensor can create a fault. To restore the system, you may need to turn the 'OUTPUT FLOW OVERRIDE' key horizontally to override the fault until the pressure in the buffer tank builds up again. Return the key to the vertical position when done.



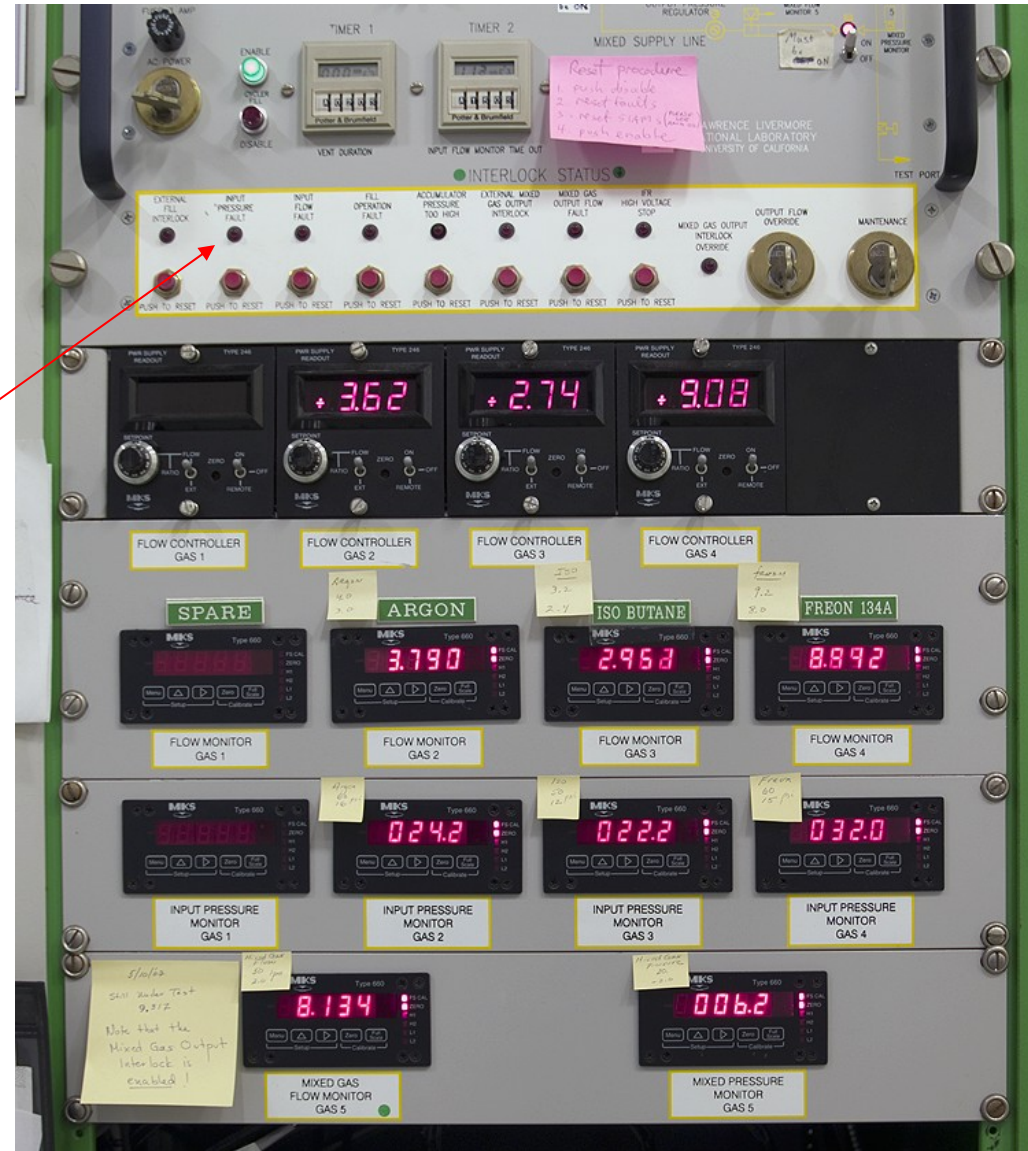


# Diagnosing the RPC mixing rack

The RPC rack will shut itself down if there is an input gas flow that is out of range; an input gas pressure that is out of range; or if the output gas flow to IR2 is out of range

The red LEDs can tell you what is making the RPC rack trip. You might have to look at the ambient data base to see what particular input gas is the cause of the trip should that be the problem

The yellow stickies show you the upper and lower trip points



## RPC input flow monitors - settings

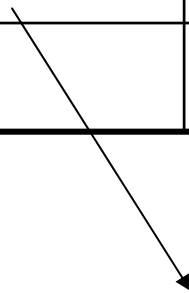
	Argon	Isobutane	Freon	
SPH1	4.0	3.2	9.2	Trip High
SPL1	3.0	2.4	8.0	Trip Low
SPH2	70	70	70	Not used
SPL2	-70	70	70	Not used
HH	.001	.001	.001	Hysteresis high
HL	.000	.001	.000	Hysteresis low
CAL	5.0	5.0	10.0	Range
dP	1.234	1.234	1.234	Decimal point

## RPC input pressure monitors - settings

	Argon	Isobutane	Freon	
SPH1	60.	50.	60.	Trip High
SPL1	16.	12.	15.	Trip Low
SPH2	7000.	7000.	7000.	Not used
SPL2	-7000.	-7000.	-7000.	Not used
HH	0.0	0.0	0.0	Hysteresis high
HL	0.0	0.0	0.0	Hysteresis low
CAL	250.	250.	250.	Range
dP	123.4	123.4	123.4	Decimal point

## RPC flow controllers - settings

	Argon	Isobutane	Freon
Setpoint	7.15	5.46	9.03
Readback	3.62	2.74	9.10
Gauge Factor	0.50	0.50	1.00



Setting for the precision potentiometer on the back of the unit

# RPC out put f low monit or s - set t ings

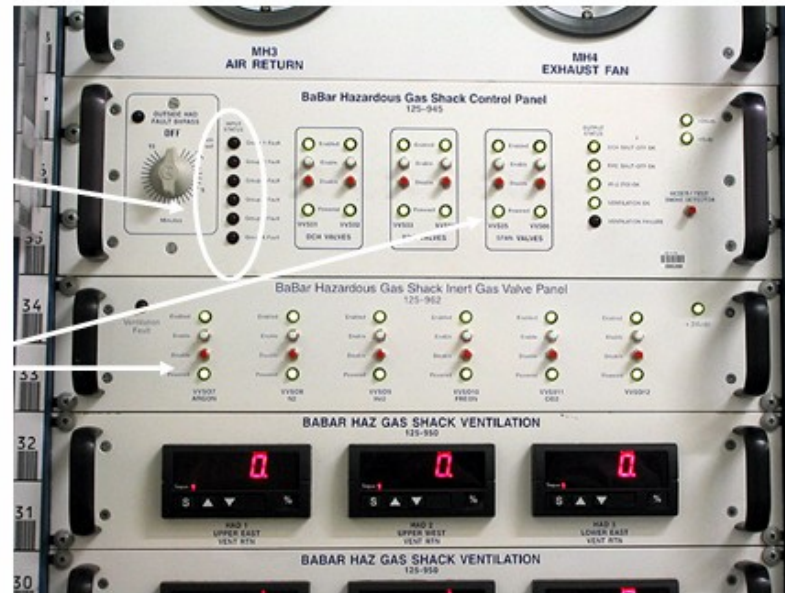
	Mixed Gas Flow Monitor	Mixed Pressure Monitor	
SPH1	50.	20.	Trip High
SPL1	2.0	-2.0	Trip Low
SPH2	70	4000.	Not used
SPL2	-70.	-7000.	Not used
HH	.001	1.0	Hysteresis high
HL	.001	1.0	Hysteresis low
CAL	54.	250.	Range
dP	1.234	123.4	Decimal point

# The Gas Shack Safety Rack B636-03

Below we show a picture of a portion of the gas shack safety rack, B636-03, concentrating on Panels 125-945 and 125-962. All of the valves in the panels should be ENABLED; press the 'enable' button if the green 'enabled' LED is off. The LEDs on the left side of Panel 125-945 will show the conditions causing the gas supplies to be shut down. After the ventilation and the HAD systems are restored, Panel 125-945 should show only a Group 5 fault (RPC system) under normal conditions.

LEDs will tell you what tripped; the labels refer to the acronyms from the logic chart (Group 1 Fault, etc.)

Each valve has both an 'enable' and a 'disable' button and a 'powered' status light. DCH and RPC valves are controlled here.



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