Welcome to MRD gas shift !!

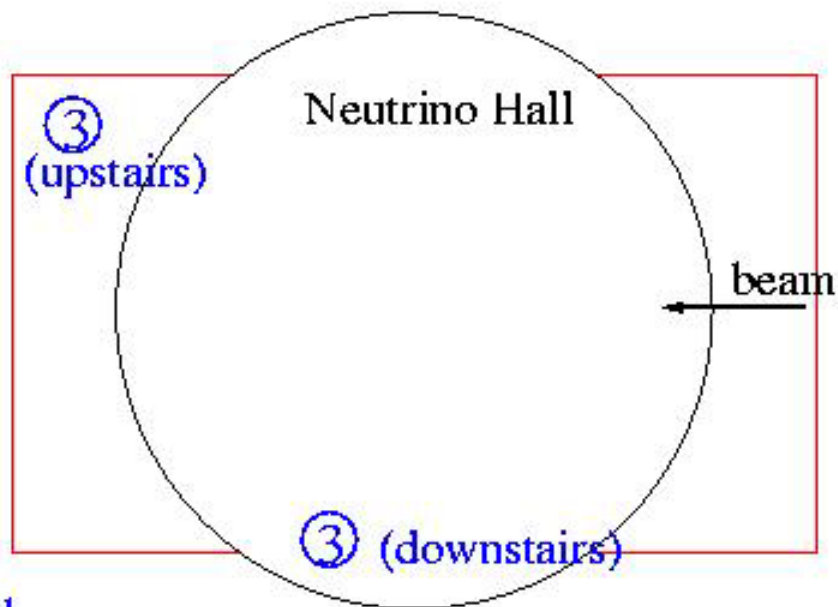
(Manual of MRD gas system check @ 29-Dec-2000)
by T.Maruyama

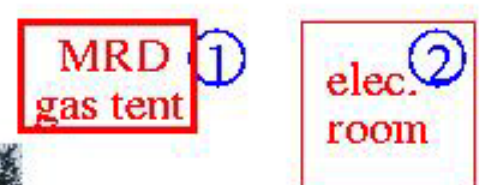
1. Check points

① MRD gas tent

② Electronics hut
(shift room)

③ Inside Neutrino Hall

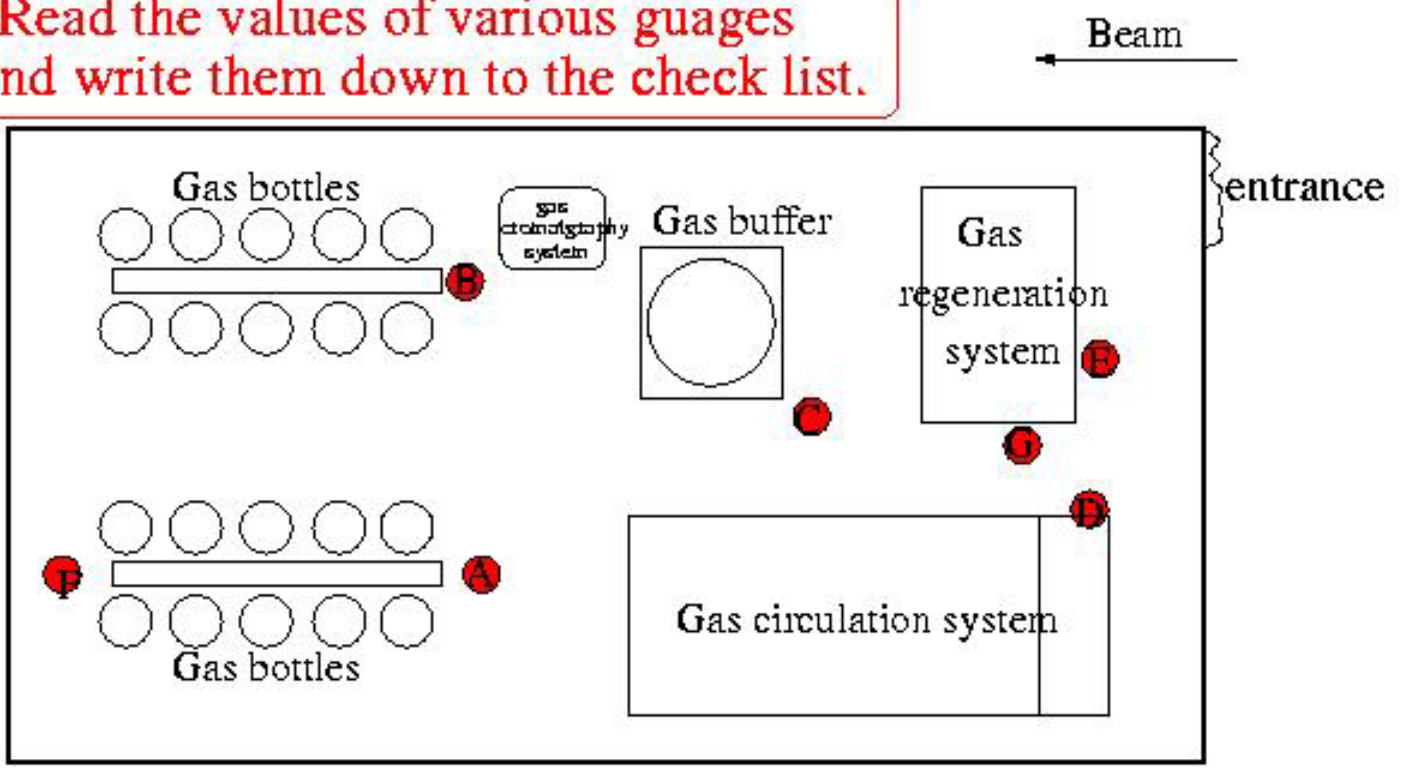




Before starting the shift, please find
"Shift check list"
inside MRD gas tent (near the entrance)

Check point (1): Inside MRD gas tent

Read the values of various guages and write them down to the check list.

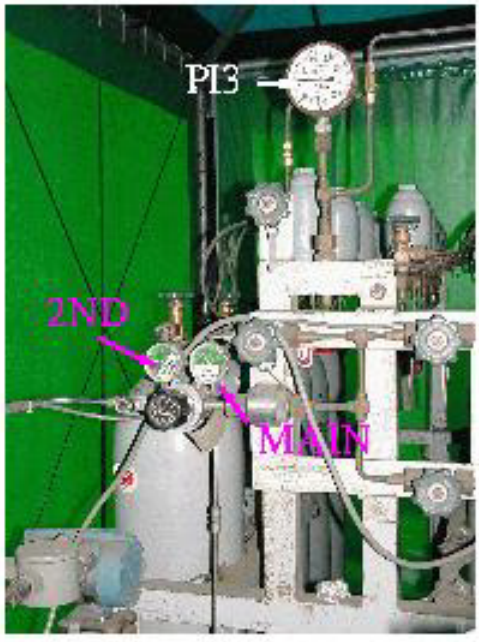


- A PI3, MAIN, 2ND
- B PI4
- C LIC
- D PI5, H2, CH4
- E PI1, PI2
  FM1, FM2, FM3
  FIC, TIC1, TIC2
- F Temp.
- G Atm.

See from next page for detailed position information.

Check point ①: Inside MRD gas tent (II)

A PI3, MAIN, 2ND



B PI4

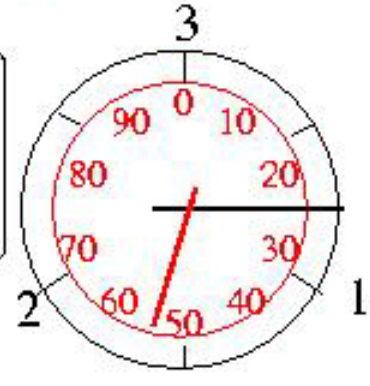
C LIC

Long hand (black): x1000

Short hand (red) : x1

long 0.7~0.8
---> 700
short 55

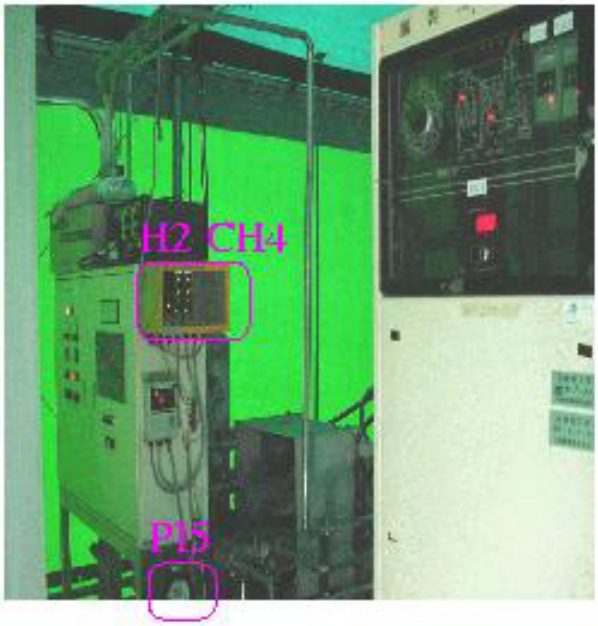
755



example

Check point ①: Inside MRD gas tent (III)

D PI5, H2, CH4

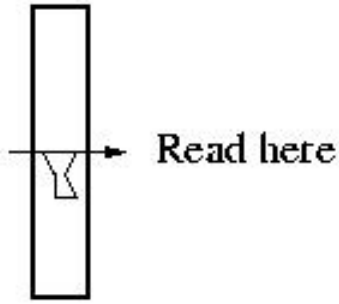


How to read H2, CH4

Alarm is beeping if that level is over the warning levels.

E PI1, PI2, FM1, FM2, FM3 FIC, TIC1, TIC2

How to read FM1, FM2



How to read TICs

Please read red line

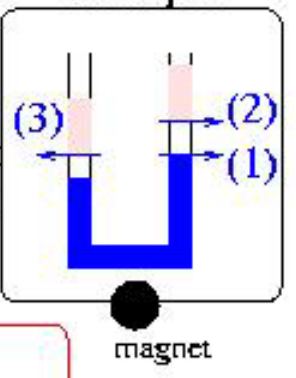
Check point ①: Inside MRD gas tent (IV)

F Temp.

Read 3 values

(1) current temp.
(2) highest temp. so far
(3) lowest temp. so far

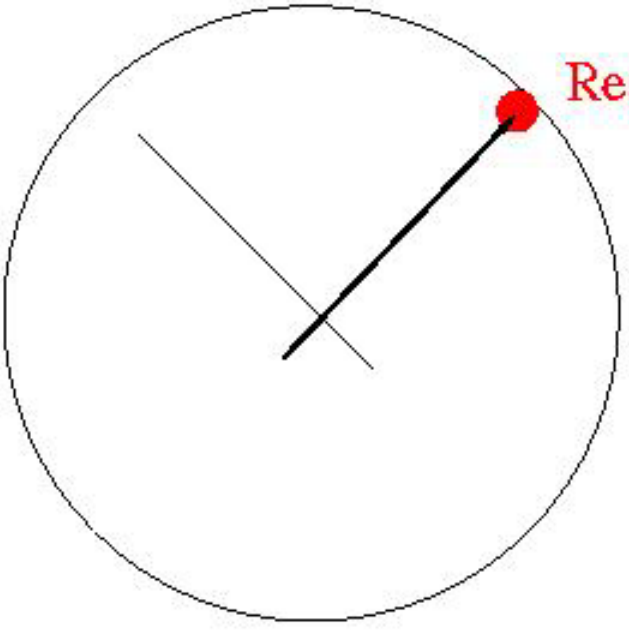
example



(4) set marks (pink in figure) as low as possible using magnet.

after reading three values

G Atm. ----> Sorry, No picture! But you can easily find the guage.



Check point ①: Inside MRD gas tent (V)

Safety limit of each guage

MAIN	> 10	FM1	2.0< <6.0
2ND	1.5< <4.0	FM2	no flow
LIC	600< <810	FM3	no flow
PI5	0.00<= <0.05	FIC	20< <70
PI1	2.5< <3.0	H2	<1
PI2	2.4< <3.0	CH4	<25
		TIC1	<+10
		TIC2	<+10

Please e-mail to experts if you have abnormal values.

maruyama@neutrino.kek.jp
ishii@neutrino.kek.jp

Please call experts if you find (MAIN < 10)

(090)-4673-2113 (Maruyama)
(090)-9643-6519 (Ishii)

Check point ②: Inside Electronics Hut (shift room)

(O_2 and flammable gas monitors for your safety!!)

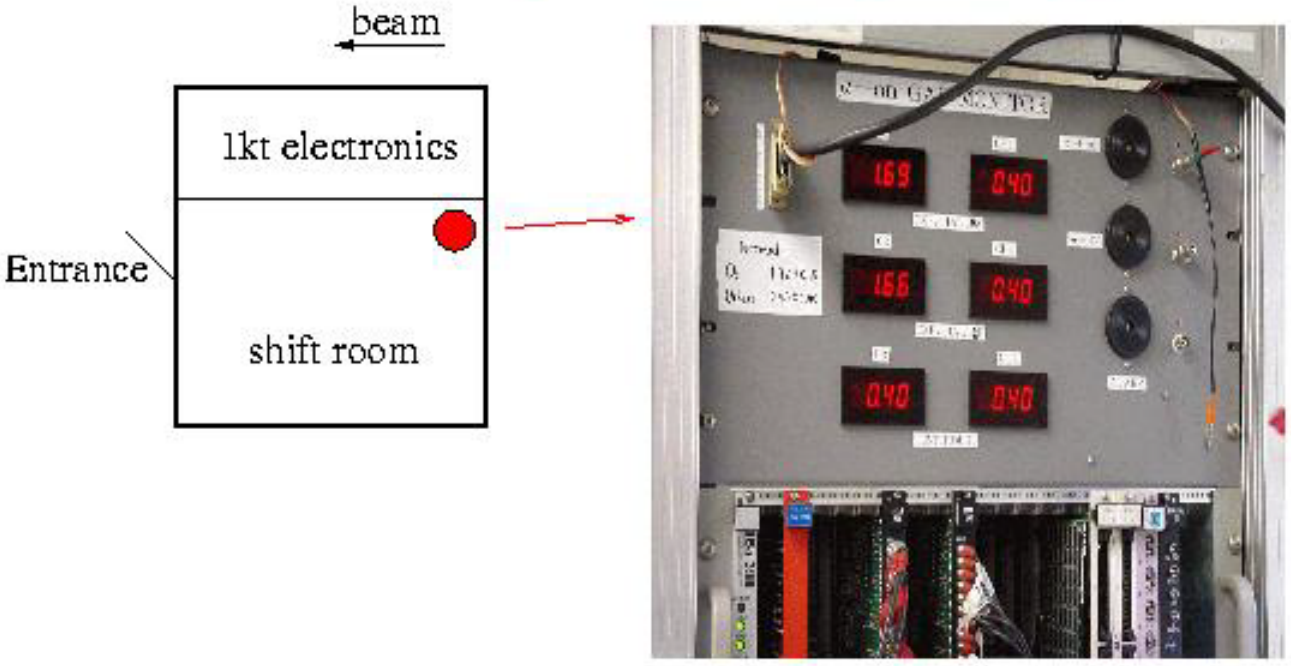


Figure 1

Check Items

- Read and write down six degital values for gas density.
  Left-top: O_2 Hall A Right-top: CH_4 Hall A
  Left-mid: O_2 Hall B Right-mid: CH_4 Hall B
  Left-bot: H_2 mu tent Right-bot: CH_4 mu tent

  for O2, 1.72 corresponds to 21% and 1.55 corresponds to 18%.
  for CH4 and H2, 0.4 corresponds to 0% and 0.8 corresponds to 25% of the lowest explosion limit.

- Check whether alarm is beeping or not.

(If those values were over the limit, alarm was beeping)

Safety limit : 1.55 < for O_2, < 0.80 for others
If the O_2 level is lower than the limit, do not go downstairs.
And call experts.

Check point ③: Inside Neutrino Hall

(1) Check FAN status

Before going down the stairway of neutrino hall, you should check the FAN status. (And write down to check list)

The center light should be ON (red).

(2) Please go down stairway.

(3) In the right side of the end of stairway, you can find gas monitor again.

See next page for detailed position

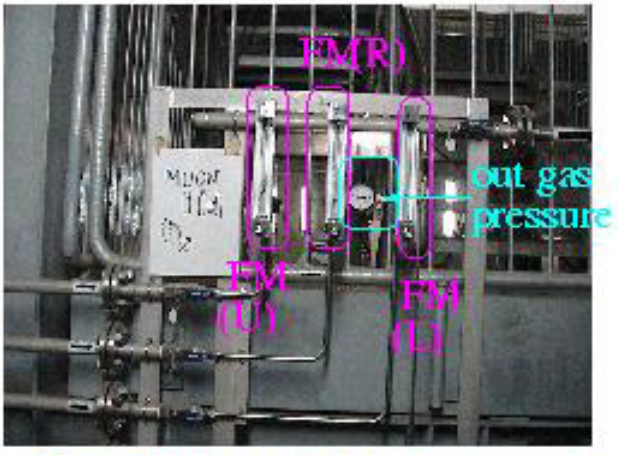
Please check O2 and CH4 density here. Run away immediately if O2 density is low or CH4 density is high! (Alarm is of cource beeping, if that works well.)

Four values are needed to check, 2 of them are O2, others are for CH4. (Write them down to check list)

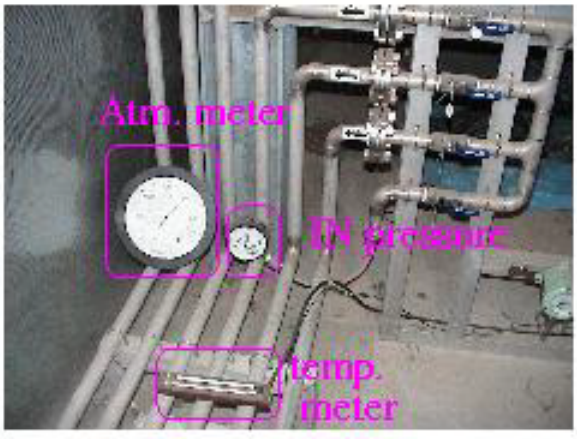
Check point ③: Inside Neutrino Hall (II)

(4) Turn right, and find the gas check system.

See below for the detailed position



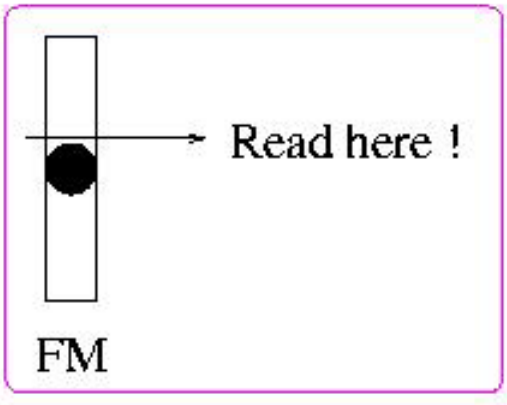
Flow meters and out gas pressure meter.

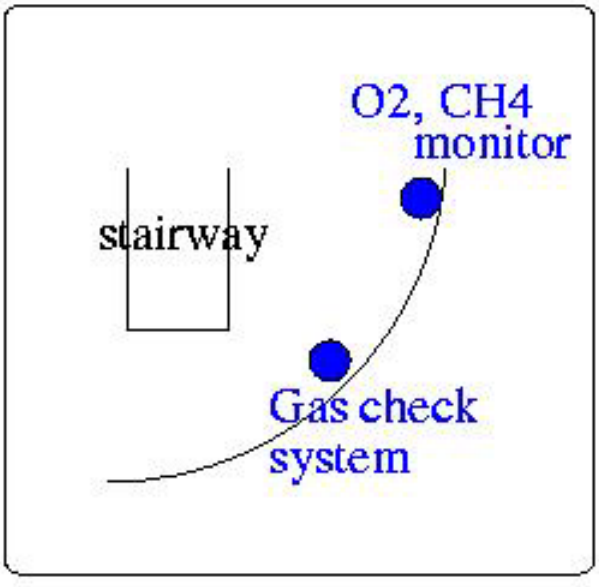


Atm., temp, and IN gas pressure meter.

(Temp. means "current temp" here, highest and lowest are not needed to read)

Please read these values and write them down!





Map

Check point ③: Inside Neutrino Hall (III)

Safety limit of each guage

IN pressure	0.03<	<0.10	O2	>18
OUT pressure	0.01<	<0.05	CH4	<25
FM (U)	10<	<40		
FM (R)	7 <	<30		
FM (L)	10<	<40		

Now we have no HV and 8V PS. No need to check these values.

Please e-mail to experts if you have abnormal values.

Shift work finished!!

Please put back check list to gas tent

Please close tent