

**RE: Gas for mRPC**

Ian Crotty <ian.crotty@cern.ch>

Thu 10/13/2022 13:45

To: Mikhail Rumyantsev <mikhail.rumiantcev@cern.ch>

Cc: Ian Crotty <ian.crotty@cern.ch>

Hello Mikhail

Thank you very much. We have already started discussing with the student doing work on humidity and gas mixing.

Bubbles even get into Nature

<https://www.nature.com/articles/s41598-019-42094-0>

And having my origins in Ireland perhaps the Irish should talk of bubbles going down in Guinness;

<https://journals.aps.org/pre/abstract/10.1103/PhysRevE.83.051609>

Cheers                      Ian

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From: Mikhail Rumyantsev  
Sent: 12 October 2022 19:31  
To: Ian Crotty  
Subject: HA: Gas for mRPC

Dear Ian.

Please, find in attachment the presentation. On page5 You will find the result of calibration of the rotameters by bubbles.

With best regards,  
Mikhail

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От: Ian Crotty  
Отправлено: 12 октября 2022 г. 11:40  
Кому: Mikhail Rumyantsev  
Копия: Ian Crotty

Tema: RE: Gas for mRPC

Hello Mikhail

All ok ?

Are you coming for your chambers or did you decide to leave them till this pm ?

I wrote to Piotr about getting a better set up to do your HV scan but I heard nothing back ?

Cheers            Ian

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From: Ian Crotty  
Sent: 11 October 2022 13:11  
To: Mikhail Rumyantsev  
Cc: Aleksandr Dmitriev; Piotr Podlaski  
Subject: RE: Gas for mRPC

Hello Mikhail

Please find the data we took yesterday;

project-cms-rpc-endcap.web.cern.ch - /rpc/Physics/Experiments/NA61/MRPC/HVcurrent scan/<<http://project-cms-rpc-endcap.web.cern.ch/rpc/Physics/Experiments/NA61/MRPC/HVcurrent%20scan/>>

There are 2 plots on the same tab

Cheers            Ian

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From: Ian Crotty  
Sent: 06 October 2022 15:08  
To: Mikhail Rumyantsev  
Cc: Aleksandr Dmitriev; Piotr Podlaski; Ian Crotty  
Subject: RE: Gas for mRPC

Colleagues

Mikhail and I have connected 2 test boxes with MRPCs inside in series at an indicated ~10l/hr gas flow rate. Given they have a volume of ~ 40 litres and 10 vol changes would be good gives 40 hrs so Monday would be very safe.

We will meet at 10am Monday to disconnect.

Cheers        Ian

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From: Ian Crotty  
Sent: 06 October 2022 09:30  
To: Mikhail Rummyantsev  
Cc: Aleksandr Dmitriev; Piotr Podlaski; Ian Crotty  
Subject: RE: Gas for mRPC

Hello Mikail

Ok fine for 2pm today.

We have x3 6mm Cu supply pipes on the wall that have been cut off the with no connection. We can be pull them down near the floor and make a short 6mm PA pipe to Box1, then a link to box 2 with PA and then a short PA 6mm to a bubbler with oil. Total PA would be ~3m. I suspect or rather hope your 1/4 inch is in fact 6mm. The 1/4 inch may refer to the thread on the other end of the union that could well be 1/4 inch BSP.

If you have a caliper please measure the exact pipe diameter. 6mm pipe is 6mm and 1/4 inch will be 6.3mm.

If you want less PA please bring clean Cu pipe.

See you in 904 on the north side of the building , I will open one of the three big red doors, the one nearest the Jura.

Cheers        Ian

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From: Mikhail Rummyantsev  
Sent: 05 October 2022 14:02  
To: Ian Crotty  
Cc: Aleksandr Dmitriev; Piotr Podlaski

Subject: HA: Gas for mRPC

Hello Ian.

The 2pm of Thursday sounds good.

The Stoubli gas connectors are mounted on the boxes. I have two short PA tubes Swagelok 1/4" - Staubli for connection. The Cu tube are more preferable for connection between Gas distributor and the boxes, but in case pipeline are not so long (a few meters) it doesn't matter.

The setup will be:

Pipeline - Swagelok 1/4" ->

Short tube Swagelok - to Stoubli ( ~ 1.5 m long) ->

Box#1 (~ 22 liters) ->

Short tube Stoubli to Stoubli ( ~ 1.5 m long) ->

Box#2 (~ 22 liters) ->

Short tube Stoubli to Swagelok 1/4" ( ~ 1.5 m long) ->

Exhaust pipeline with babblers.

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От: Ian Crotty

Отправлено: 5 октября 2022 г. 13:04

Кому: Mikhail Rummyantsev

Копия: Aleksandr Dmitriev; Piotr Podlaski

Тема: RE: Gas for mRPC

Hello Mikhail

I am occupied this afternoon. Can we see at 2pm Thursday

What do you want to use as pipe material Cu or PA ( Rilsan) ?

Cheers

Ian

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From: Mikhail Rummyantsev

Sent: 05 October 2022 10:03

To: Ian Crotty  
Cc: Aleksandr Dmitriev; Piotr Podlaski  
Subject: HA: Gas for mRPC

Dear Ian.

When Can we start flushing mRPC? Maybe today after lunch?  
We only need to put the detectors in the boxes. I have a car for transporting boxes between buildings.

Best regards  
Mikhail Rumyantsev.

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От: Piotr Podlaski  
Отправлено: 4 октября 2022 г. 11:34  
Кому: Mikhail Rumyantsev; Ian Crotty  
Копия: Aleksandr Dmitriev  
Тема: Re: HA: Gas for mRPC

If the mRPCs were not installed in the area but just stored in the experimental hall then you can take them directly.

Cheers,  
Piotr

W dniu 04.10.2022 o 09:55, Mikhail Rumyantsev pisze:  
Hi Ian.

Thanks You for help!  
This gas mixture is fit good for HV test. The volume of the box is about 30l. So the flash 5 l/h for one night will be enough. A bubbler on the exhaust is important point of the flashing.

Piotr, can I take of the mRPC from NA building or I should to do it through buffer zone?

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От: Ian Crotty

Отправлено: 3 октября 2022 г. 18:11  
Кому: Piotr Podlaski; Mikhail Rumyantsev  
Копия: Aleksandr Dmitriev; Ian Crotty  
Тема: RE: Gas for mRPC

Colleagues

Can the CERN gas group help at the NA61 beam area ?

In 904 there is both wet and dry mix of 0.5% SF<sub>6</sub> , isoButane 4.5% and rest R134a gas. I guess 5 litres/hr ( Max10) is sufficient. If it is just to flush for 24 hrs then should be fine.

Cheers            Ian

PS pipe dia is 6mm x 4mm. You need a bubbler on the exhaust ?

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From: Piotr Podlaski  
Sent: 03 October 2022 15:52  
To: Mikhail Rumyantsev  
Cc: Aleksandr Dmitriev; Ian Crotty  
Subject: Re: Gas for mRPC

Hello Misha,

Unfortunately obtaining mRPC gas mixture or freon alone will not be possible from our side on such a short notice. As you mentioned, presently at CERN there is no one from our gas group to organize supply of the required gases. Maybe Ian can organize something for you in CMS RPC lab?

Best regards,  
Piotr

W dniu 03.10.2022 o 15:46, Mikhail Rumyantsev pisze:  
Hello Piotr.

I will stay for 2 weeks at the CERN. It is not planned trip, but i try to make it useful for us. Ian kindly offers his help. We plane to prepare some mRPC

from reserve for replace the current tripped mRPC. We have test boxes, cables and HV sources. In this key, is it possible to have mRPC gas mixture (or just one freon) for HV checking outside the beam area? I know no one from Polish group stay at CERN now, but maybe it can be organized remotely.

With best regard

Mikhail Rumyantsev.