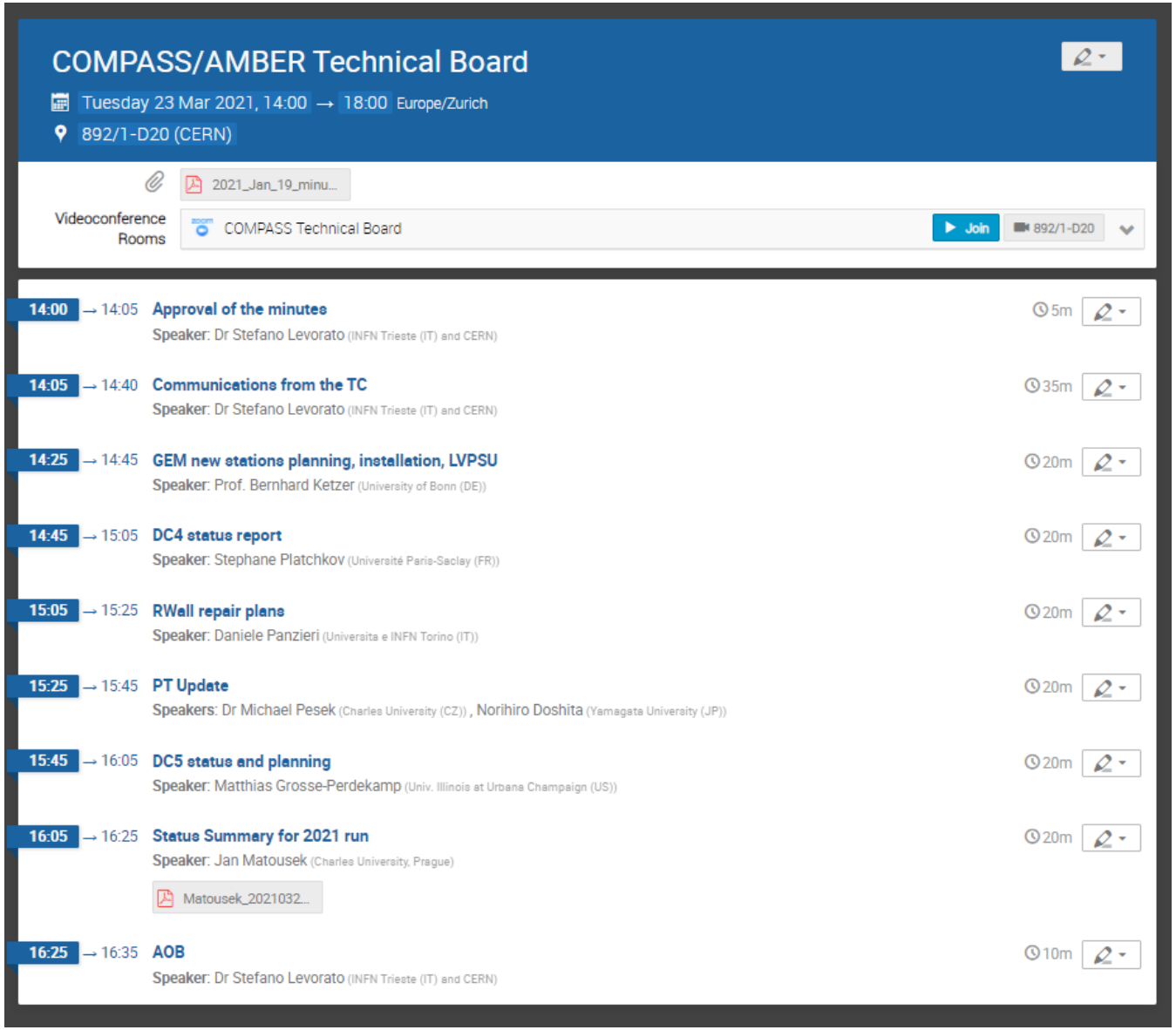
Joint COMPASS and COMPASS++/AMBER TB

23 March 2021

Stefano Levorato

AGENDA

- Approval of the Agenda of the last TB
- Communications
  - TB membership
  - COMPASS archive in 892
  - 22/03/2021 power cut
  - CV Services restart at CERN
  - COMPASS Gas interruption
  - STRAW 3 HV interface
  - Mezzanine storage → 883
  - ECAL0 Storage
  - DC4 Intervention
  - H1 status
  - Flammable gas renovation
  - He4 pump PT
  - PT Gunn Diode
  - Wiener LVPS
  - Request of financing
  - PRM Setup
  - PRM Gas System



Comments, Corrections, Request for the minutes of the last TB

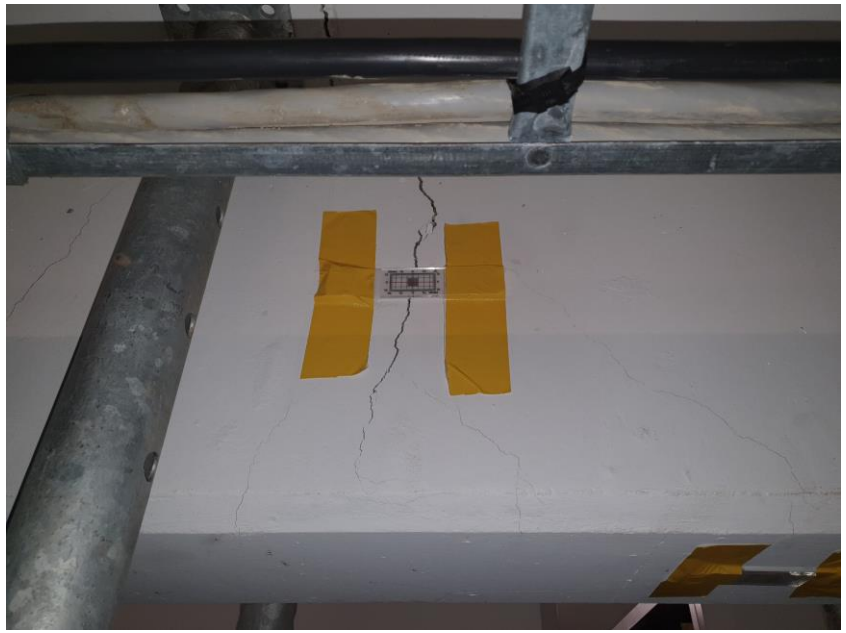
→Approval

Elected members as of 21.05.2020		Mandate N - EoM
Jens	Barth	III - May 2022
Norihiro	Doshita	I - Feb 2022
Bernhard	Ketzer	III - May 2022
Igor	Konorov	III - May 2022
Jan	Friedrich	I - Nov 2021
Daniele	Panzieri	III - May 2022
Stephane	Platchkov	I - Nov 2021
Marcin	Ziembicki	II - March 2021

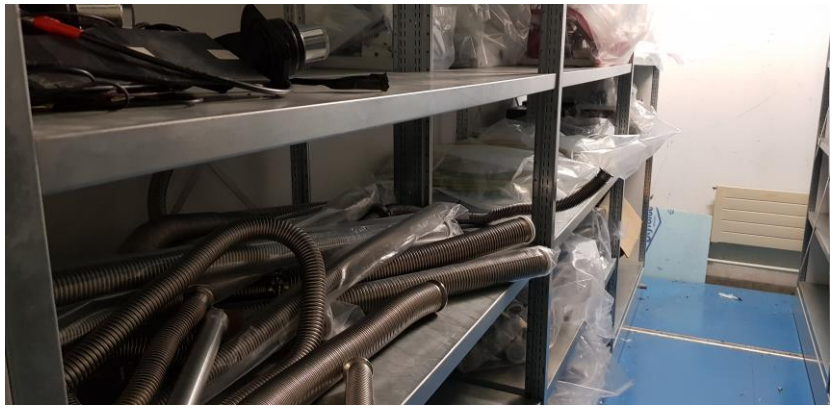
Ex-officio members		
Stefano	Levorato	Chair, Technical Coordinator
Oleg	Denisov	Co-spokesperson
Fulvio	Tessarotto	Co-spokesperson
Permanent guests		
Franco	Bradamante	Senior Advisor
Alain	Magnon	Senior Advisor
Vladimir	Anosov	Engineer
Vincent	Andrieux	Analysis Coordinator
Gerhard	Mallot	Senior Advisor
Jan	Matoušek	Run Coordinator

Marcin Ziembiki membership ends this month

Preparation for the AMS clean room installation is progressing, there are even some structural issue who forces the Intervention to be performed as soon as possible



TUM (Cold Silicon) material has already been moved and stored on the last shelf of 892 Archive, Saleve side



Issue with Lead-Glass blocks
RP checked them → Radioactive, I will move them where we have also the other calo blocks

Part of the material has already been moved to 883
With a little of delay (w.r.t. mid April) and a lot of effort we have nearly all COMPASS material stored.
Thanks to those who helped me!

Power cut on 22 March

From James Devine <james.dilwyn.devine@cern.ch>

Reply | Reply All | Forward | Archive | Junk | Delete | More

Subject **RE: [IMPACT] Note de Coupure - [Power cut of EOD210/A81 et EOD211/A81]**

3/22/2021, 3:00 PM

To Filippo Resnati, Giovanna Lehmann Miotto EP-DT-DI, Xavier Pons <Xavier.Pons@cern.ch>, Johan Bremer, Michel Chalifour <michel.chalifour@cern.ch>, Caroline Fabre, Jamie Boyd <jamie.boyd@cern.ch>

Cc Letizia Di Giulio, Francois Duval, Mike Capell, Stefano Levorato

Dear all,

Before I report back on the test this morning, I just wanted to check that there were no issues I'm not aware of on the EP side. As far as I know, all our systems performed as expected, with no surprises. If you encountered any difficulties please let me know and I will compile them.

Initial feedback from EL is that the BA81 (upstream of EHN1) power cut revealed some unidentified circuits relating to the fire detection and level 3 alarms. There were also some problems after the test re-arming the circuit breakers due to their age, so it's a good thing that the switchboard will be replaced very soon. The power cut to EOD211/A85 in B. 911 also took place as expected.

Best regards,
James

From: James Devine
Sent: 15 March 2021 16:30
To: Filippo Resnati <Filippo.Resnati@cern.ch>; Giovanna Lehmann Miotto <Giovanna.Lehmann@cern.ch>; Xavier Pons <Xavier.Pons@cern.ch>; Johan Bremer <Johan.Bremer@cern.ch>; Michel Chalifour <michel.chalifour@cern.ch>; Caroline Fabre <Caroline.Fabre@cern.ch>; Jamie Boyd <jamie.boyd@cern.ch>
Cc: Letizia Di Giulio <letizia.di.giulio@cern.ch>; Francois Duval <Francois.Duval@cern.ch>; Mike Capell <Michael.Capell@cern.ch>; Stefano Levorato <Stefano.Levorato@cern.ch>
Subject: RE: [IMPACT] Note de Coupure - [Power cut of EOD210/A81 et EOD211/A81]

Dear all,

Just in case you haven't already received the notification via other channels, there will be a test power cut to one of the UPS supplying EHN1/EHN1 upstream infrastructure (Switchboards EOD210/A81 and EOD211/A81 in BA81) on Monday 22nd March for 40 minutes from 9am. The objective of the exercise is to ensure there are no critical systems supplied by these switchboards, before the upgrade work takes place in April. Up to 40% of the circuits from these switchboards are not identified at present, so there may be some unexpected outages!

Based on our experience back in September 2020, there should be no direct impact on any of the Cryo system supplies in EHN1. EN-EL are also double checking with IT that all the critical star points have their double supplies correctly set up prior to the test. However, an as yet unidentified upstream system may reveal itself during this test. The 9am test will be followed by one at 13h for 40 minutes cutting EOD210/A85 (supplying ECN3, so there should normally be no impact on EHN1/2).

If you have a problem during the test, please report it to the CCC in the first instance via 72201. I will be available to help with diagnostics if something unexpected does occur.

The proposal was presented at the EATM on the 9th March and has now been validated by TIOC. You can find the full slides here: https://indico.cern.ch/event/1015657/contributions/4262507/attachments/2203647/3729207/UPS_Replacement_NA_EDMS_2499011_v0.2.pptx

Plan for approval

- ✓ **The feedback from the identified stakeholders has been adressed**
- ➢ **Two power cut tests will be organized by EN/EL to clear remaining uncertainties:**
  - **22.03.2021 at 9:00** for 40 minutes : EOD210/A81 and EOD211/A81 (B. 890)
  - **22.03.2021 at 13:00** for 40 minutes: EOD211/A85 (B. 911)
  - Stakeholders, and TSO are invited to participate.
  - In case of unexpected event, please call the TI at the CCC: ✆ 72201.
- **If no major issues, the intervention will be carried out :**

Switchboard

Switchboard	Start	End	Duration of the power cut
EOD210/A81	19.04.21	20.04.21	1 hour out per outlet (circuit)
EOD211/A81	21.04.21	22.04.21	1 hour out per outlet (circuit)
EOD210/A85	27.04.21	28.04.21	1 hour out per outlet (circuit)

09.03.21 UPS Replacement in N.A. - Impact & Planning - EATM 10

Best regards,
James

The objective of the exercise is to ensure there are no critical systems supplied by these switchboards, before the upgrade work takes place in April. Up to 40% of the circuits from these switchboards are not identified at present, so there may be some unexpected outages!

→ No impact on COMPASS, all system were operating fine
In case any issue was noticed please let me know.

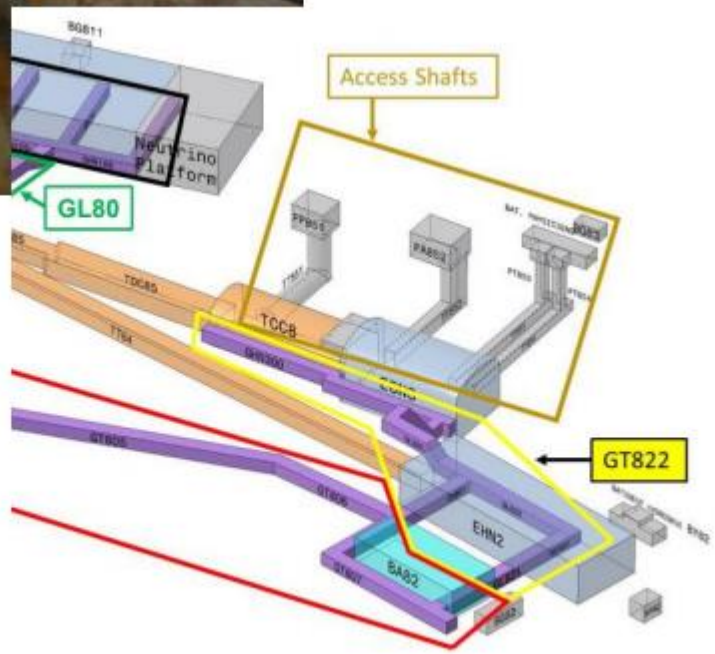
North Area

- Chilled water interruptions:
  - TT81 + TT82: 16 October 2020 – 29 January 2021.
  - TT84: 16 November 2020 – 26 Mars 2021.
  - Cooling towers (CT2, b 893):
    - Stop from 15 December 2020.
    - Maintenance from 4th to the 15th January 2021.
    - Restart 20 January 2021.
  - Cooling stations (demineralized water) will start:
    - BA80 ED: 22 January 2021.
    - BA81 ED: 29 January 2021.
    - BA82 ED: End of January, according to request by NA62.

5

Already with respect to the preliminary plan above presented delays have been accumulated, for the time being do not affect our scheduled operations. At the moment ~ 3 weeks delay (to be confirmed). Work performed in the framework of the technical galleries consolidation.

Example of defects



Chilled water Available
Raw Water available
Demineralized water will be available mid April
DAQ already on CERN Chilled water

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- Restart 20 January 2021.
- Cooling stations (demineralized water) will start:
  - BA80 ED: 22 January 2021.
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  - BA82 ED: End of January, according to request by NA62.

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delays have been accumulated, for the time being do not
our scheduled operations. At the moment ~ 3 weeks del
be confirmed). Work performed in the framework
technical galleries consolidation.

Example of defects

Scale: Week | Group | MORE OPTIONS

Task name	Duration	Start date	Finish date
East Area			
AD/ELENA			
North Area			
NorthArea_LS2-Restart		01/01/2021	01/03/2022
Important dates	886d	02/07/2018	11/02/2022
TDC2 TCC2 BA80	620d	29/11/2018	18/06/2021
BA81 / TT81 / TT82	578d	11/02/2019	18/06/2021
EHN1	849d	10/09/2018	01/03/2022
EHN2 / M2	681d	19/11/2018	01/09/2021
Open days	2d	14/09/2019	15/09/2019
891 (BA82) Crinoline Renovation	1d	11/12/2020	11/12/2020
Gas network renovation (908)	65d	16/11/2020	26/02/2021
SM1 magnet test	2w	19/11/2018	30/11/2018
Alignement MBPL TT84	1w	03/05/2021	07/05/2021
Renovation pont PR-545	2w	12/08/2019	23/08/2019
Renovation pont PR-539	5w	16/09/2019	18/10/2019
Target Tests	3mo	21/09/2020	11/12/2020
COMPASS Target Cooling	41d	01/03/2021	28/04/2021
Rail Remplacement EHN2	25d	07/09/2020	12/10/2020
XCM Remplacement 19 moteurs	1w	22/03/2021	26/03/2021
Cablage BA82-EHN2 gas ICS + RP	7w	04/01/2021	19/02/2021
NA64 muon installation	20w	12/04/2021	01/09/2021
Deplacement manifold	1w	25/01/2021	29/01/2021
Maintenance EN-EL BA82	3d	16/09/2020	18/09/2020
Tests AUG BA82 (no acces)	1d	30/09/2020	30/09/2020
TT84 Consolidation of chilled water pipes	19w	16/11/2020	13/04/2021
Inside Crinoline and Platform Renovation	2w	12/04/2021	23/04/2021
DSO tests EHN2 + ECN3 (BA82)	2d	12/05/2021	17/05/2021
NA-CONS tasks (tbc)	63d	04/01/2021	31/03/2021
ECN3 / TCC8 / TT85	610d	14/11/2018	19/05/2021
HiRadMat			

-------- Перенаправленное сообщение --------
Тема: Switch from N2 to Ar
Дата: Wed, 10 Mar 2021 11:39:53 +0100
От: Stefano Levorato <stefano.levorato@cern.ch>
Кому: compass-de@cern.ch, Technical Board COMPASS <compass-tb@cern.ch>

Dear Colleagues,

this morning at 8:30 we switched from N2 to Ar removing the "winter bypass".

All PLC and gas system have been checked after the switch and were performing as expected.

Thanks

kindest regards

Stefano

Switch needed to start the C4F10 gas precleaning activity for RICH-1.
Filter regeneration takes approximately 20 hours @ 1 m3/h → 20m3 x 2 filer sets = 40 m3
Operation is repeated approximately every 3 days

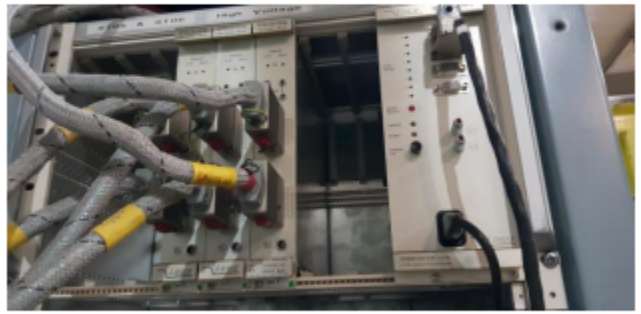
Around midnight of Sunday 14 March the Argon flow was stopped, it was noticed on the morning of 15th when the nitrogen bypass was reinstalled to get gas back to detectors.

Investigation was opened→ the operator has forgotten to open the valve of the second bottle set at the central distribution center so when the system switched from the first to the second set, we have been left without gas

No impact on all detectors but PD of RICH-1 where contamination may have accumulated

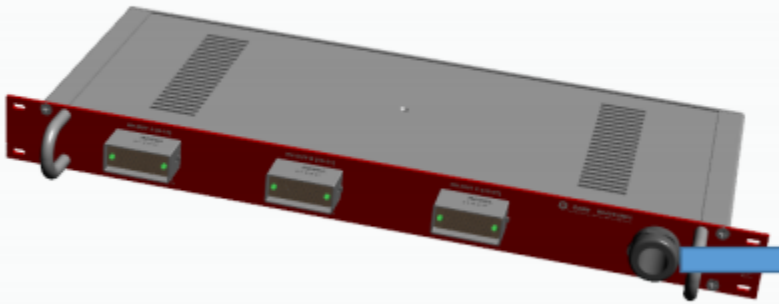
A non-conformity procedure has been opened with the new gas supplier

Replacement of the old ISEG HV power supply system → CAEN A7030DP



6 X 16 = HV cannels on EQN 20 025p

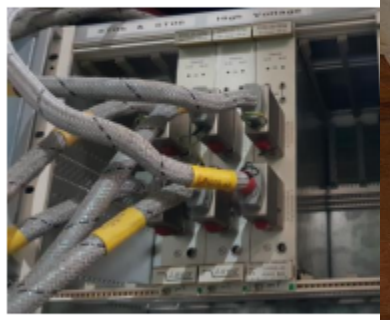
Modules and mainframe ordered. Modules received on January 2021, integrated in the LHC inventory, not yet tested at the EPOOL since they were out of the CAEN CERN convention. Preliminary tests from us (Christope) soon. Mainframe still to be received. Open issue the interface from the Redel to Radial connector type. Discussed the technical solution with CAEN →



To the A7030

Rack mounted device
Delivery expected beginning of March 2021

Replacement of the



Modules and mainf
EPOOL since they w
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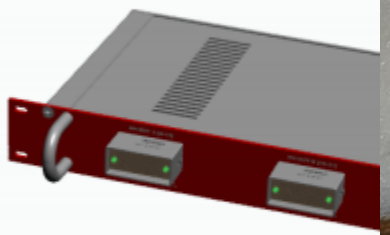
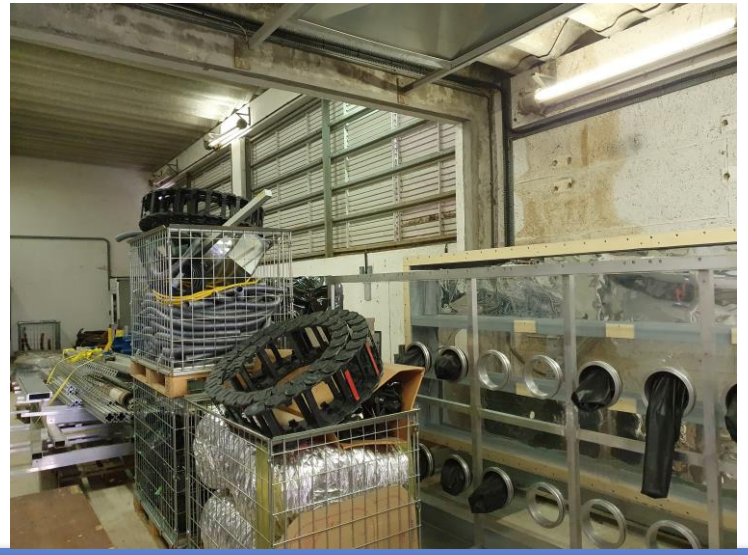


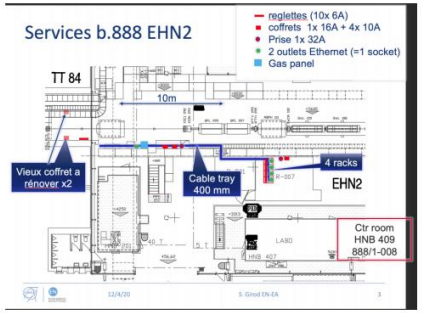
evice
d beginning of March

Installation will be performed soon →
Straw 3 fully equipped for 2021
Filter Regeneration will be taken care by TC/TS


HNB 411
COMPASS



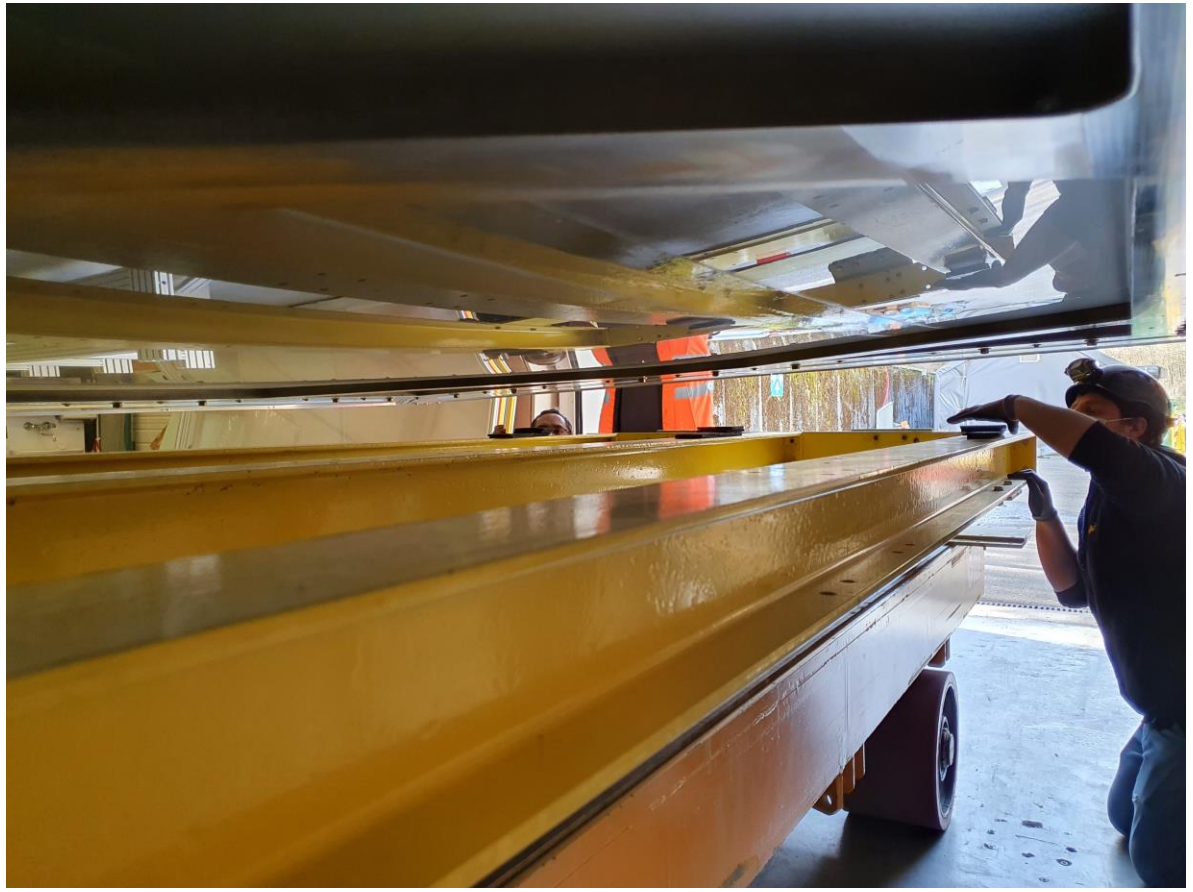

HNB 411
COMPASS



Request of moving the material stored there:
ECAL0, ECAL0 electronics, LH target

Moving of ECAL0 → Crane people + Vladimir Anosov
Stefano and Livio (TS)

On site Dedicated team from Saclay Yann, Damien, Didier,
COMPASS Vladimir Anosov, Vincent Andrieux, Stefano Levorato, EP-DT technician+ crane and help of other colleagues!



On site Dedicated team from Saclay Yann, Damien, Didier,
COMPASS Vladimir Anosov, Vincent Andrieux, Stefano Levorato, EP-DT technician+ crane and help of other colleagues!

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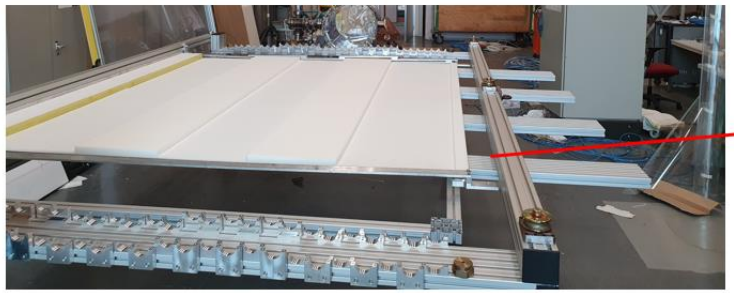
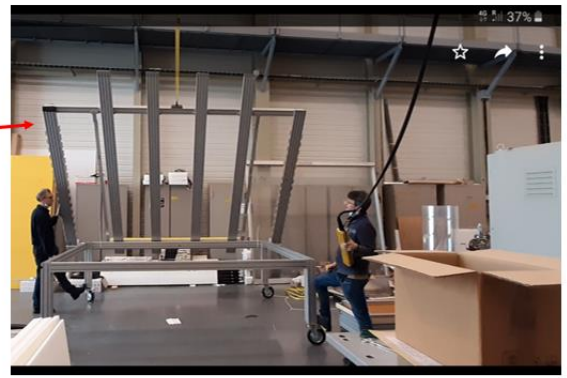
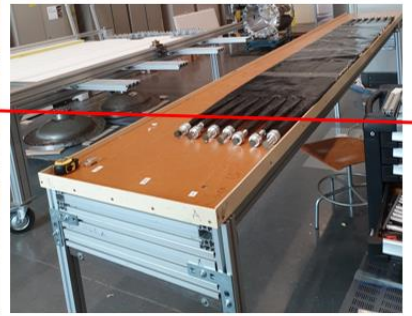
COMPASS Vladimir Anosov, Vincent Andrieux, Stefano Levorato, EP-DT technician+ crane and help of other colleagues!

Some difficulties in the 2 to 3 beam structure (alignment)
Preliminary check of electrodes insulation → fine

H1 Planning update

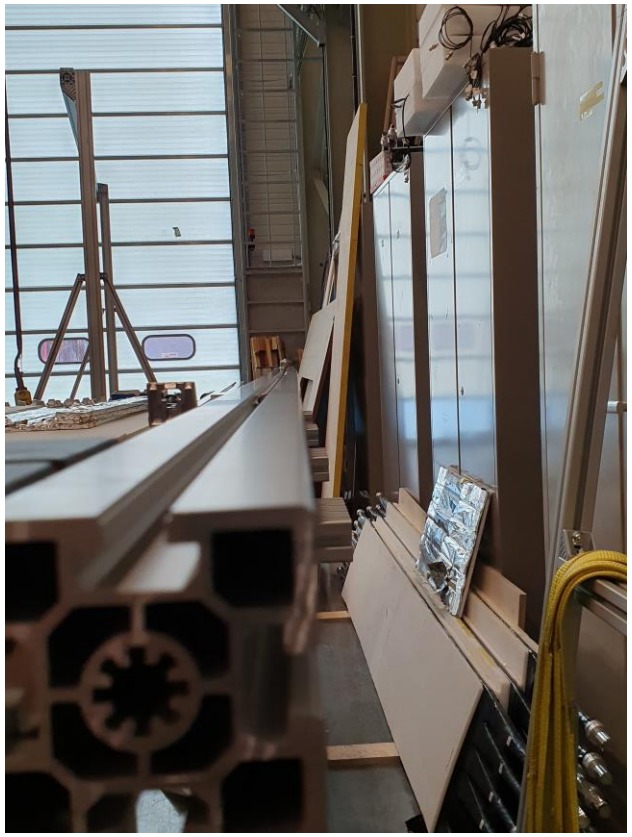






In the next days the support spacers for the aluminum vertical bars will be prepared, ready for installation of slabs at the beginning of next week.

Stefano Levorato | COMPASS Collaboration meeting - CERN | February 25 26 21



→ Bending of the horizontal support bar → new bar plus L shaped reinforcement being produced
→ Different thickness w.r.t. requested one → spacer foil being delivered next week
→ Goal be ready for the week of 18 April when the H1 slab modification/reinstallation should restart

This Morning: Installation of the last rack for the methane bottle set

Upgraded Gunn diode is being delivered to CERN for test

Fig.1 The fuse view

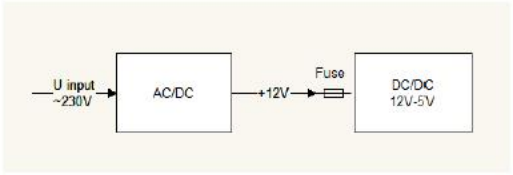


Fig.3 The switch view

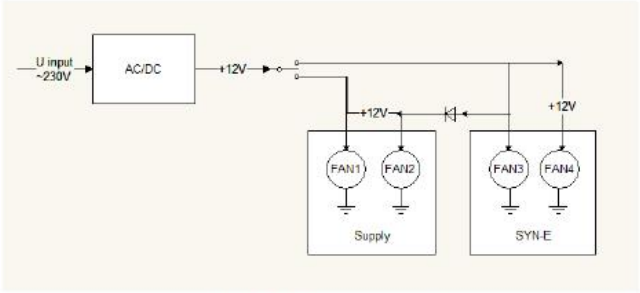
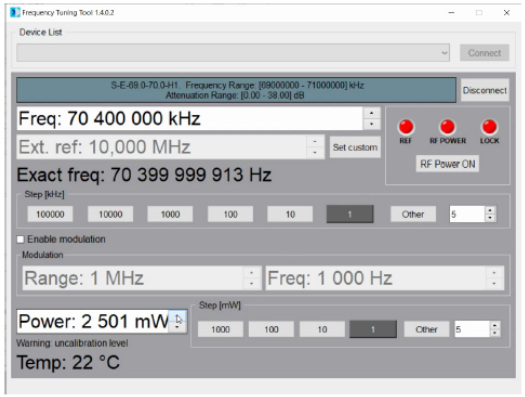


Fig.4 The switch connection diagram



+ Driver to integrate in COMPASS system

The operating range has been expanded from 69.8-70.2 GHz to 69.0-71.0 GHz. In the entire range, the maximum power was measured at several points. The values of the maximum power at intermediate points are calculated by approximation on the software side.

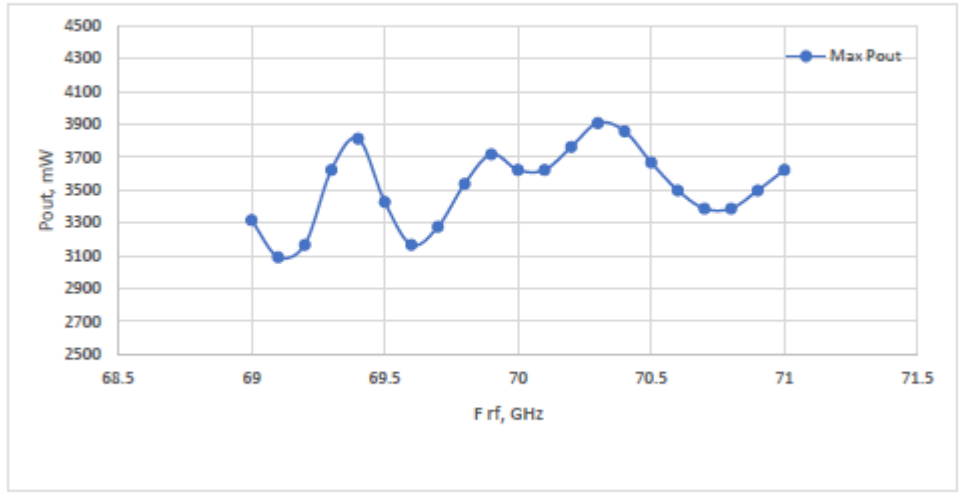
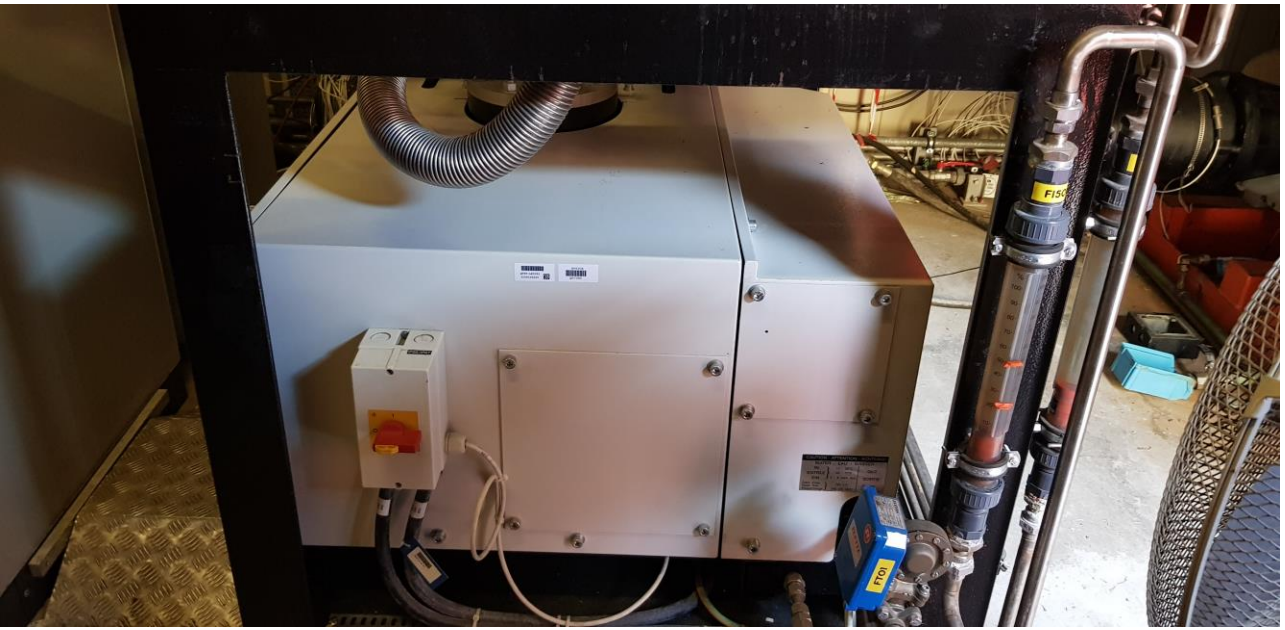
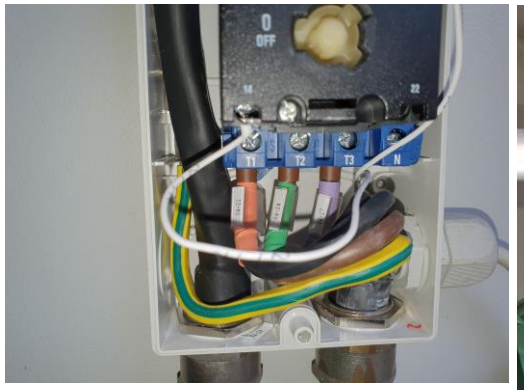
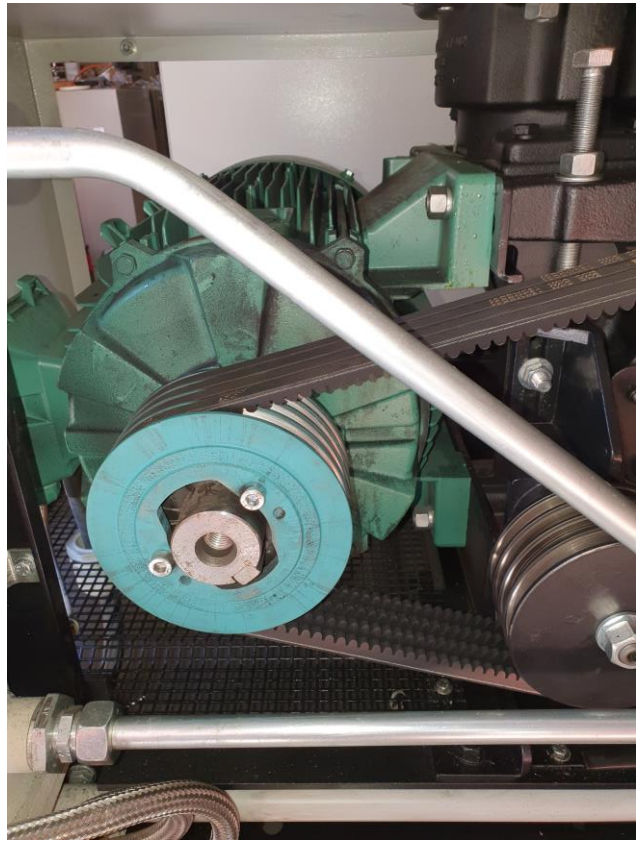


Fig.5 Maximum output power.







Failure of the pump yesterday 22/March
Measured resistance between phases 0.5 Ohm
No short towards gnd
Most likely problem of the electric engine,
The pump looks fine→ SIMEV contacted, available to come next Monday
We would still perform some test (tomorrow)

8666780 - Purchase Requisition (DAI) Order signed

Attach | Document options

By signing this request, you acknowledge your responsibilities related to the approval of the DAI.

Created by Alisson YI (IPT-PI-RI) **Tel: 66571** on **08.03.2021 10:08** (Last modified on **08.03.2021 17:42**)
Created by BAAN: **No**

General Information

This document replaces:	8659918
General Description *:	**Wiener PS UNITS REPAIR COMPASS**
	View reception history
Technical Contact *:	Stefano LEVORATO (EP-SME-CO) Tel: 65389 164850
Contract:	
Departmental Request (DR):	
Supplier:	**WIENER POWER ELECTRONICS, Linde 18, 51399 BURSCHEID, DE (WIEN25, MA01)**
Contact for order:	
Currency *:	**EUR (Euro)**
Transport Cost *:	**Transport costs are included on a separate order line below**
Packaging *:	**Packaging costs are included in the unit prices**
Indicate whether this request involves "Research and Development" and/or prototype work? *	**No** *If yes, please provide additional details in a justification to be enclosed to this DAI.*

Procurement Guidelines

Articles appearing in the CERN catalogue, or similar articles must be requisitioned from the store.

Total Value: €8,477.00 (CHF 9,394.00)

Exchange rate B: 1.108400 as of date 08.03.2021

Order Lines

Type	Part No.	Serial No.	Input	Fuse	Power	Output	U0	U1	U2	U3	U4	U5	U6	U7
UEP 5021	0384.2130k	1697098	90-265 VAC/ 47-63Hz max. 16A	2x16AT	Pout (90VAC): 2160W	Pout (>112VAC): 2680W	+V5/A200	+12V/40A			-5,2V/100A	-12V/40A		-2V/100A
UEP 5022	0384.2130k	2099014	90-265 VAC/ 47-63Hz max. 16A	2x16AT	Pout (90VAC): 2160W	Pout (>112VAC): 2680W	+V5/A200	+12V/40A			-5,2V/100A	-12V/40A		-2V/100A
UEP 6021	0P00.0004	1700107	92-264VAC/47-63Hz	10AT		725/1173W	+5V/115A				+5,2V/115A			
UEP 5021-040-2	0381.2130e	0100059	92-264VAC/47-63Hz	2x15AT		725/3010W	5V/200A	+12V/40A		+3.3V/100A	-5.2V/100A	-12V/40A		-V2/A100
UEP 5021-E40-2	0384.2133e	0200034	92-264VAC/47-63Hz	2x15AT		1450W/3580W	+5V/200A	+V12/A40	+15V/30A		-5,2V/100A	-12V/40A	-15V/30A	-2V/100A
UEP 5021-K40-2	0384.2130K	2099013	90-265VAC/47-63Hz max. 32A	2x16AT	Pout (90VAC): 2160W	Pout (>209VAC): 2680W	+5V/200A	+12V/40A			-5,2V/100A	-12V/40A		-2V/100A
PL 6021	0P00.0142	2199009	90-265 VAC/ 47-63Hz max. 16A	external 16AT	Pout (90VAC): 1080W	Pout (>188VAC): 2250W	+3,7V/100A; 1+/2-	+6V90A; 3+/6-		+4.3V/100A; 7+/8-	+3.7V/100A; 4+/5-			+6V/90A; 9+/12-
PL508 L	0P08.L156	1494121	100-240VAC/50-60Hz max. 16A	external 16A type B/C	Pout (100VAC): 1150W		2...7V/115A 1+/2-				2...7V/115A 4+/5-			

Delivery expected in 8 weeks → mid May

Trigger:
WA7435NXAAA2 24ch multipin common floating negative -3.5kV 3.5mA module as replacement for the broken A1535N 24CH. 3.5KV/3MA NE.

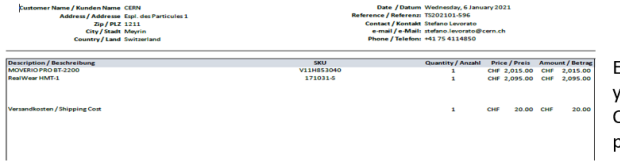
~ 5 kCHF

Remote assistance at COMPASS

EPSON Moverio 2200

HMT Realwear

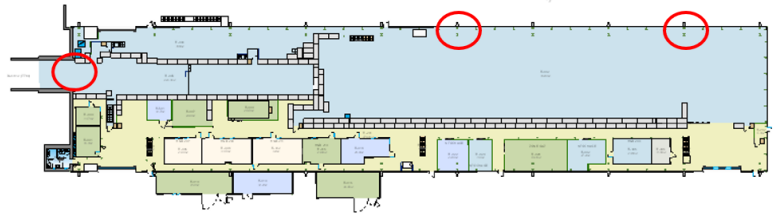
Remote assistance devices have been tested, The first during the dry run, the second after it due to its availability
Both well performing, same price range ~ 2 kEuro, HMT superior performance and fully hands free. 3 kE with accesories



Extremely useful for remote operations
your opinion ? Should we purchase a device?
Only problem, needs network coverage not present everywhere at COMPASS.

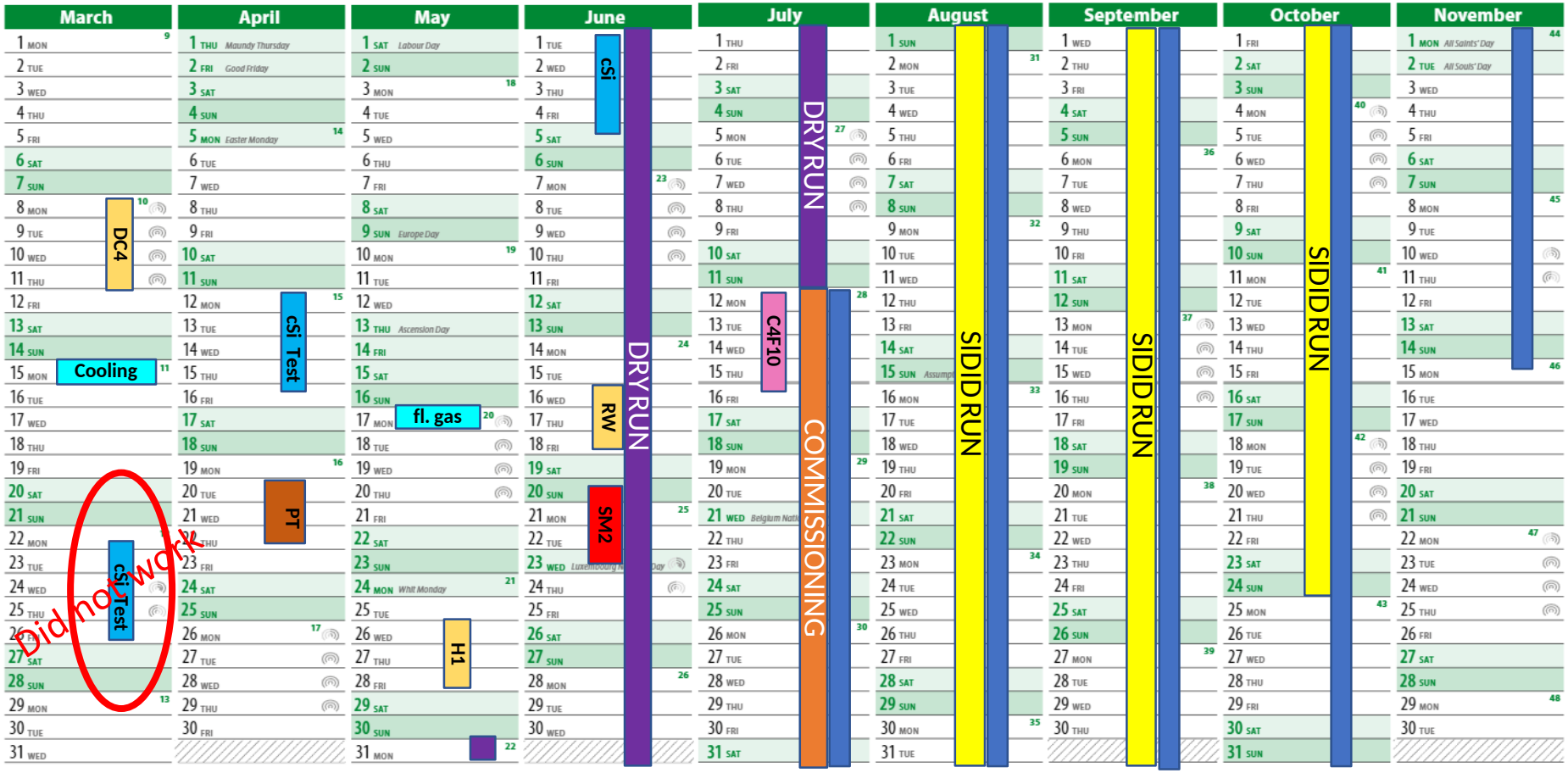
HN2 – 888 WI-FI coverage: modernization

BE (formerly EN-EA) agreed for the installation and the financial support of the wi-fi coverage of the 888 building
3 Wi-Fi access point will be installed, we will be granted to have control on the via snp protocol to power them on and off (effect on detector noise)



Full network coverage of 888 will be available in 1.5 months from now → helpful for remote support! → Moritz

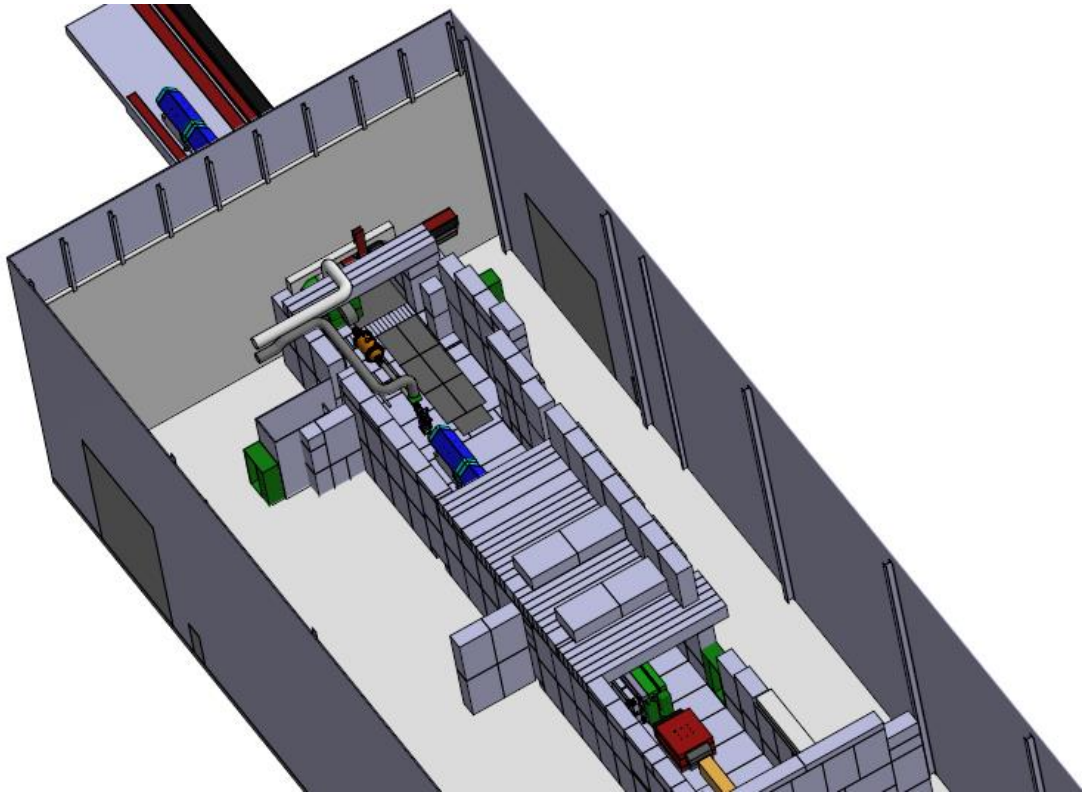
Propose to purchase 3 kE



DC5 GEM SciFi

Request for information and availability of detectors experts for surveying → **only 2 answers**

Planning for detector expert availability → **very few answers**

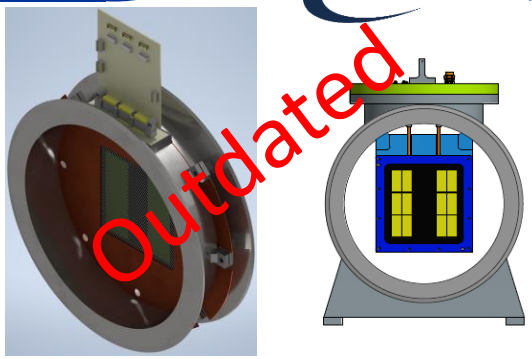


System setup for the PRM 2021 run

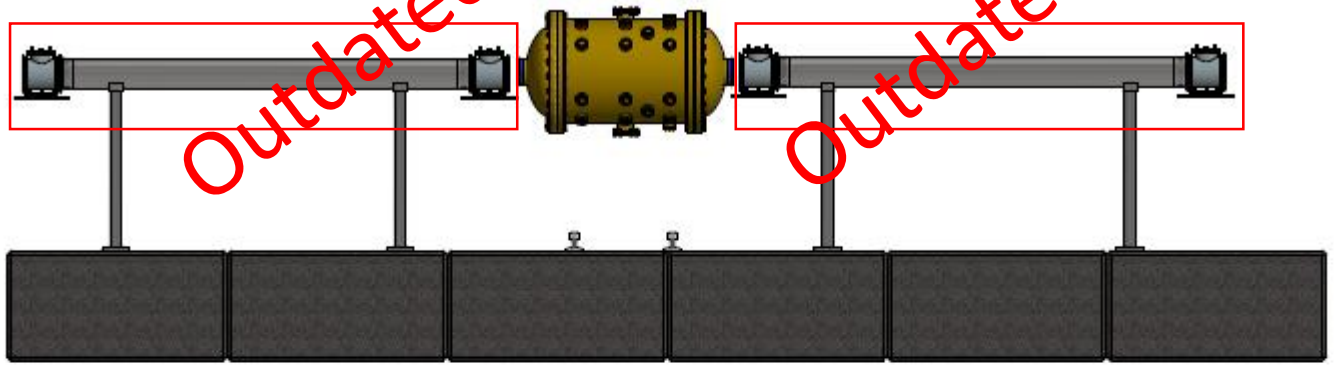
A) Silicon Tracker

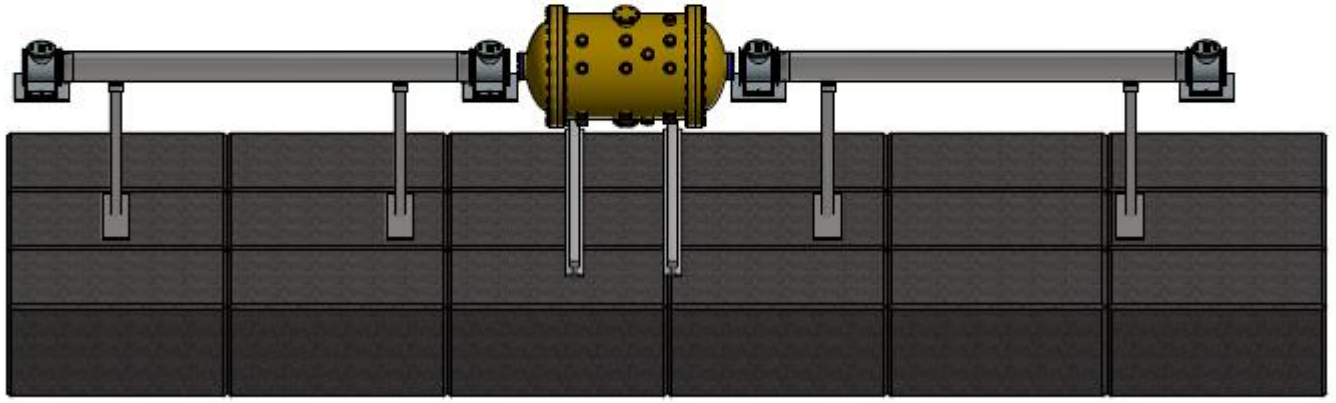
B) Scintillating Fiber

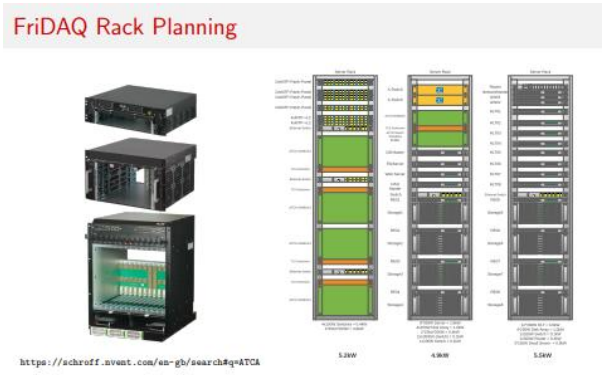
C) TPC
- TPC DETECTOR
- GAS System circulation



A) DAQ System



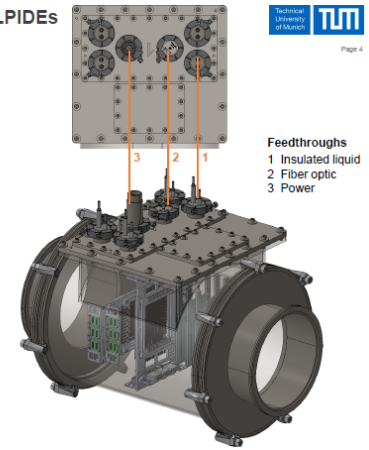




Common Mounting Structure for SciFis and ALPIDEs

Read-Out Electronics

- We discussed the placement of read-out electronics in our group and concluded that we prefer to have them as close to the detector as possible (i.e., inside the beam tube)
  - Shortest analog signal paths, which is important due to the small number of photons we expect per fiber
  - Minimizes number of electrical feedthroughs and susceptibility to induced noise
  - No need for custom-built (i.e., glued) high-density feedthroughs, which are prone to leakage
- Optical fiber feedthrough and passive optical splitter for data connection to eight front-end cards placed directly on the back of SiPM arrays
- Distance between front-end electronics and beam axis ~15 cm for SciFis
  - Radiation should not be an issue, but we will obviously need to confirm this
  - Add debug connection (JTAG) to FE electronics for reprogramming in case of SEUs in memory

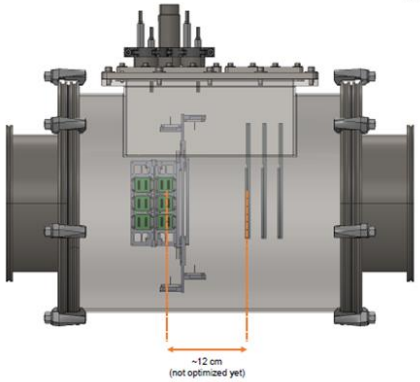


Common Mounting Structure for SciFis and ALPIDEs

General Mechanics

- Modified DN 400 ISO-K tube section
  - ~500 mm long
  - Modified standard part, can be ordered easily from standard suppliers (e.g. Pfeiffer Vacuum, VACOM, …)
  - DN 400 ISO-K weld flanges are ~570 € per piece, so I would expect the total cost for one full section to be roughly 3 to 5 k€
- One full SciFi detector (two planes per coordinate) plus three ALPIDE assemblies
  - Spacing currently about 12 cm, with further optimization possible
- Adapters from DN 400 to e.g. DN 250 ISO-K (or whatever tube diameter we would like to have in the final setup)

➢ **If this looks like a reasonable approach, I can contact suppliers to inquire about early price estimates, delivery times, etc.**



- Four ALPIDE / SciFi stations, each with full alignment mechanics
- Beam tubes have independent support mechanics (not shown here) and are connected to stations via bellows
- Entrance and exit flanges made from stock (stainless-steel or aluminum) flanges with center region milled down to ~2-3 mm thickness
- TPC still missing in model

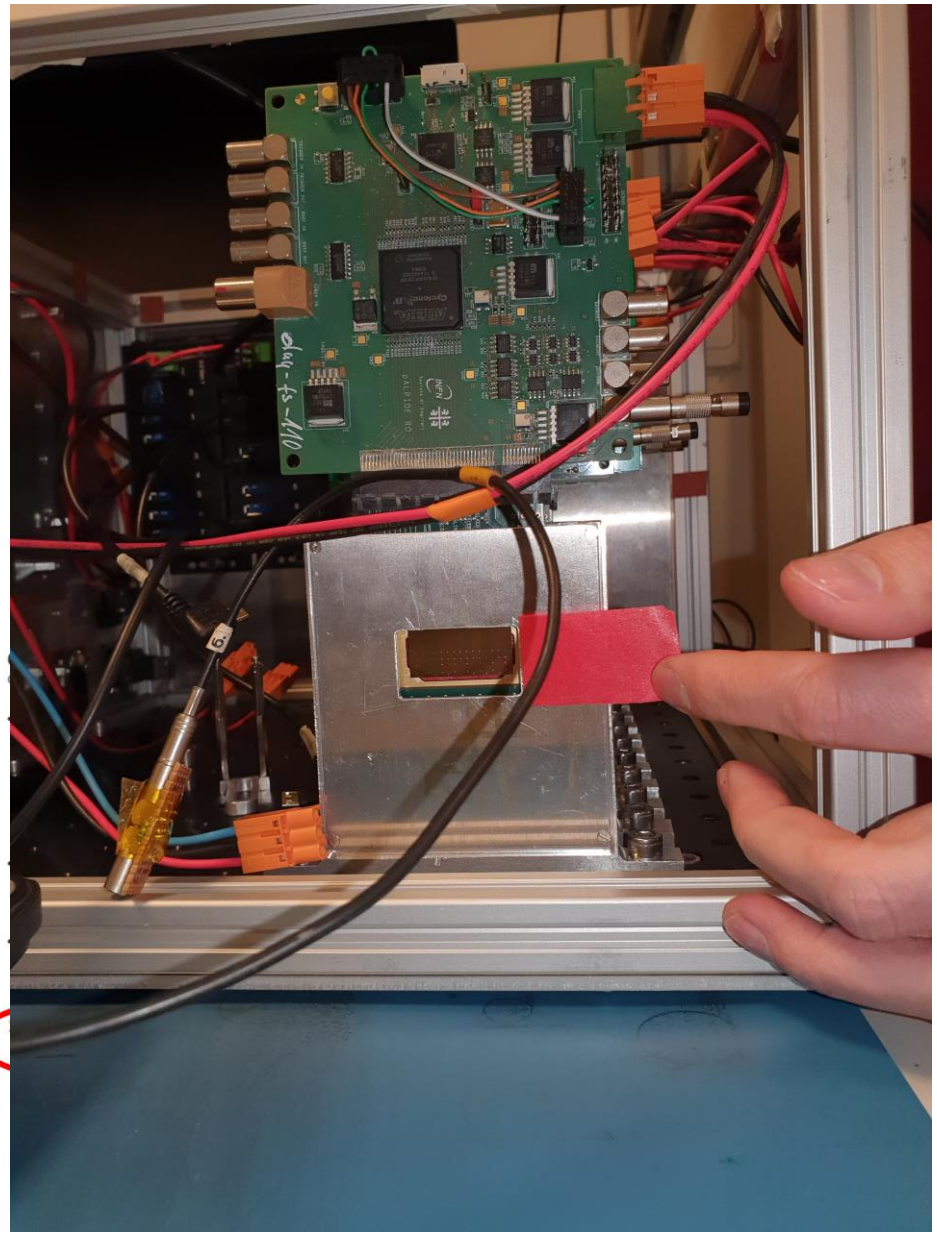
(The weird length of beam tubes in the model is only so I can export for Christian without overlapping geometries)

Meeting with M. Alekseev to discuss the implication for the Alpide mechanical support

→ Advantages in this solution, high integration, Common Structure being developed by TUM

Planning for 2021
feasibility and time delivery under definition by TUM (**higher cost**)
- 1 Station with 1 plane of Alpide (base scenario) + Fibers

Tracking for 2021 via Alpide trackers by GSI/CERN under study
(DAQ integration/Mechanical support/Availability of stations)



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Tracking for 2021 via Alpide trackers by GSI/CERN under study (DAQ integration/Mechanical support/Availability)

Meeting with Magnus Mager (ALICE) is planned this week

IKAR TPC and MAIN TPC hydrogen gas circulation system

Stefano Levorato on behalf of Evgeni Maev, Oleg Kiselev, Alexander Vasilyev, Fulvio Tessarotto

Goal: define the technical and safety aspects to proceed

- For the purchasing of the material (long delivery time so orders must be processed very soon)
- To define the pressure tests needed and perform them
- To allow for enough time to install the gas system and test it before it is needed (Sep 2021).
- To schedule the operations with the constrains by beam time allocation

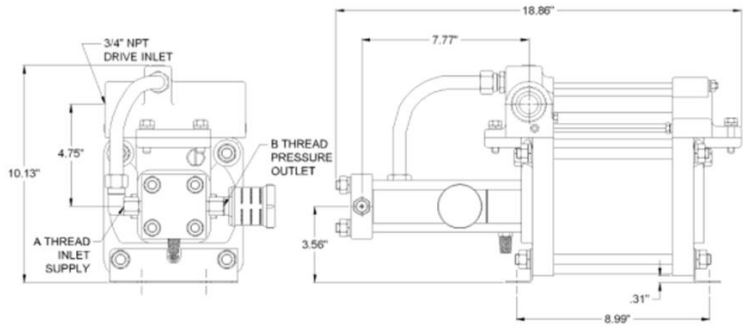
https://indico.cern.ch/event/1014498/ pw protected 03032021

Presentation of the IKAR TPC and main TPC
Hydrogen gas circulation system
→ HSE, FGSO

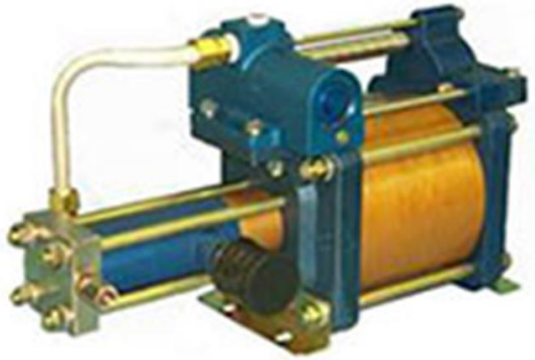
The recirculation system project was discussed at length, we have been asked for

- the definition of physical space occupied by the system to define the ATEX area in 888-R413 (Vasilyev)
- the change of the compressor → must be ATEX and CE, can not be deregulated since commercial products are available
- Proceed with the pressure test at CERN for the use of the pressurized vessels
- Not clear if a retention funnel is needed for the Be windows

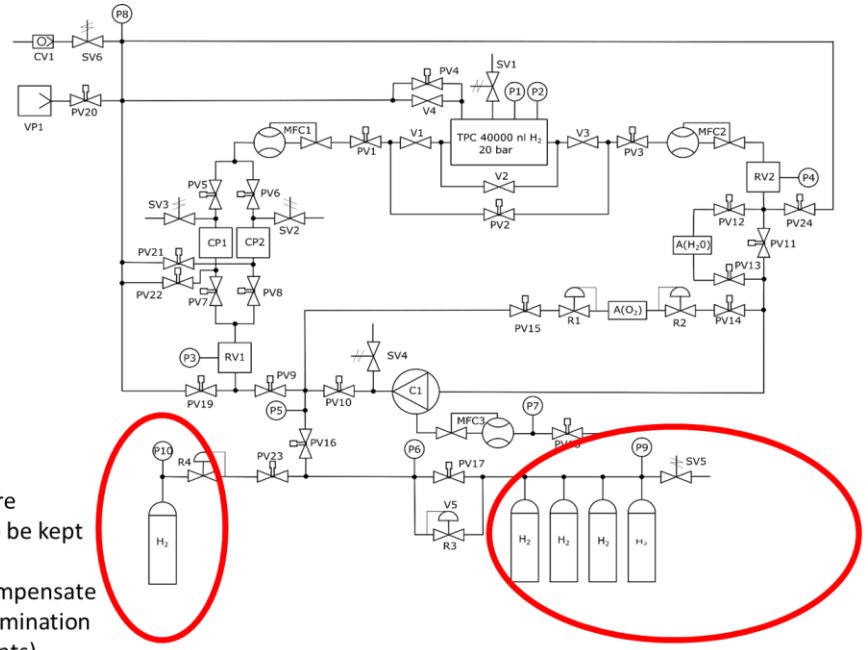
https://schydraulic.com/GBSeries-SingleStage-Acting.php



Model No.	Maximum Material Rated Gas Supply Pressure (Ps)	Maximum Material Rated Gas Outlet Pressure (Po)	A Inlet Port B Outlet Port	Static Outlet Stall Pressure	Minimum Inlet Gas Pressure (Ps)	Displacement Per Stroke (in3 per cycle)
GB-15	2,250 psig	2,250 psig	1/4" NPT	15 Pa	50 psig (3.5 bar)	7.05
	155 bar	155 bar	1/4" NPT			
GB-30	4,500 psig	4,500 psig	1/4" NPT	30 Pa	100 psig (7 bar)	3.1
	310 bar	310 bar	1/4" NPT			
GB-75	6,000 psig	11,250 psig	9/16"-18 (1)	75 Pa	250 psig (17 bar)	1.2
	410 bar	775 bar	9/16"-18 (1)			



~ 50kCHF,
Already
started to inquire
the market for solutions



Bottle of pure Hydrogen to be kept inside the barrack (compensate for 02 contamination measurements)

CERN H2 distribution

DATA SHEET

Mass Flow Controllers & Meters

SLAMf Series

Elastomer Sealed, Digital, Gas Mass Flow Controllers & Meters for Hosedown/Washdown Hazardous Area Applications

Whether it's dust, moisture, temperature extremes or washdown requirements, the SLAMf Series thermal mass flow controllers and meters deliver the precise accuracy and long-term stability of our proven SLA5800 family of meters and controllers. A specially engineered IP66 enclosure protects our advanced digital electronics and ensures stable, accurate measurement and control of your process-critical gas and liquid mass flows. The SLAMf Series is well suited for chemical and petrochemical research, laboratory, analytical, fuel cell, biotechnology, and life science applications, among others.

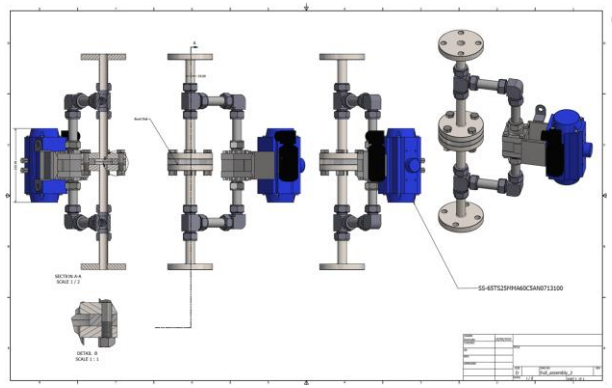
Highlights of the SLAMf Series mass flow products include: industry leading long term stability; accuracy backed by superior 17025 metrology systems and methods using primary calibration systems directly traceable to international standards, and a broad range of analog and digital I/O options to suit virtually any application. An independent diagnostic/service port permits users to set alarms and diagnostics, tune, troubleshoot or change flow conditions without removing the mass flow controller from service.

The SLAMf Series provides a highly configurable platform based on a simple modular architecture. The feature set was carefully selected to enable drop-in replacement and upgrade of many brands of mass flow controllers. With the wide range of features and options available, the SLAMf Series provides users with a single platform to support a broad range of applications.

Model
InstaTrans-XD
Oxygen Transmitter

Initially only fast release of gas was implemented/foreseen:
Burst disk or fast relief valve → upgraded to double mode

- Slow release before bursting (to be implemented) , no damage to the inner structure
- Fast release→ in case of accident



Upgraded Triple GEMs (CG3G)

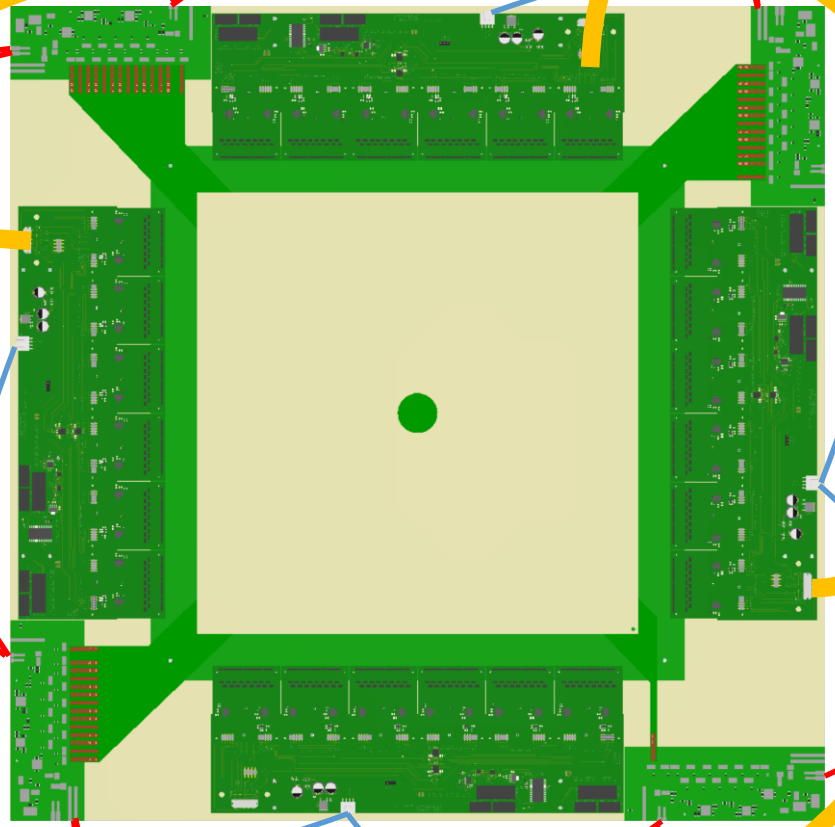
- 1 station = 2 detectors = 4 planes
- 12 APV25 (S1) per plane

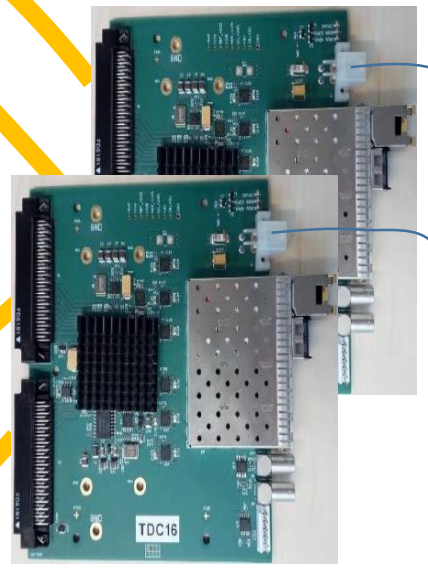
Required Power Supply Rails for 1 Detector:

- 4 kV, 1 mA for GEMs & Drift
- 3.3 V, 3 A (4x) for APV Supply (floating, remote sense wires)
- 5 V, 3 A for each ADC (floating)

New ADC chain (iFTDC) (for 24 APVs in total)

Flat cable EQDP-014-40.00-STR-SBL-5-B

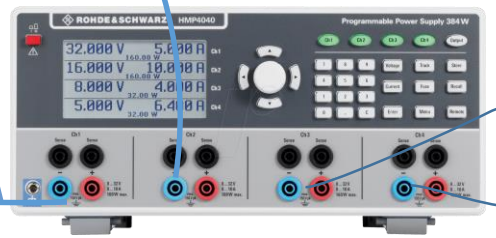




3,3V & 2x3A

Per ADC +5V & <3A

S-HV cable HV COAX CABLE HTC-50-1-1, 5kV RED type HTC-50-1-1



3,3V & 2x3A

Rohde&Schwarz HMP4040 | 4 chan. (each 10 A), 384 W

A732N (6kV, 1mA)

CAEN SY527 Mainframe

Triple GEMs with VMM (CG4G)

Rohde&Schwarz HMC8043 | 3 chan. (each 3 A), 99 W

Auxilary front-end electronics: (2.9 – 3.5) V, 2.4 A

→ 6.9 – 8.4 W

Deutronics DN35W-5 (5.5V, 6A)

O
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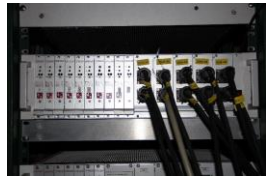
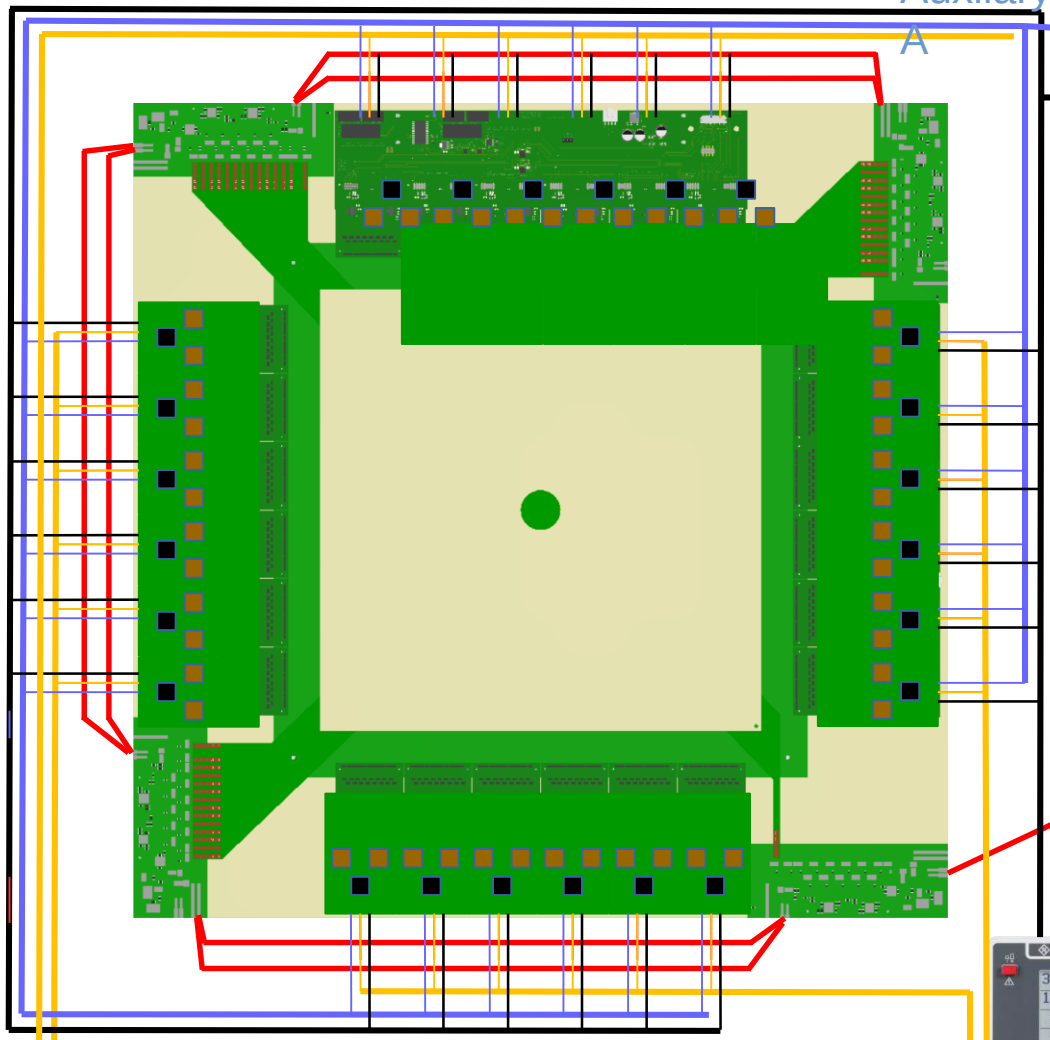




Example SRS VMM hybrid:

- *2 VMM ASICs, Aux.(FPGA, ...)*
- *VMMs: (1.9-3.5) V @ 1.67 A*
- *Aux.: (2.9-3.5) V @ 0.1 A*

→ 24 hybrids/detector

Bare VMM ASIC: ~0.8 A @ 1.2 V
48 VMM ASICs need/detector

- 1 station = 2 detectors = 4 planes
- 24 VMM3a ASICS per plane

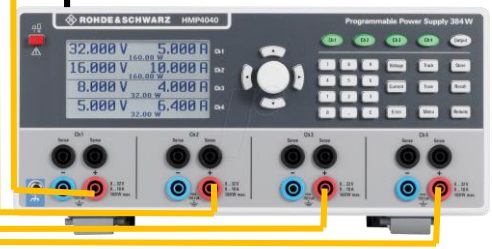
Required Power Supply Rails for 1 Detector:

- 4 kV, 1 mA for GEMs & Drift
- VMM ASICs:
- (1.9 – 3.5) V, 24 x 1.67 A grouped to 4 x 10 A
- Auxilary front-end electronics:
- (2.9 – 3.5) V, 2.4 A (all front-end boards)

S-HV cable HV COAX.CABLE HTC-50-1-1, 5kV,RED
type HTC-50-1-1

CAEN SY527 Mainframe

A732N (6kV, 1mA)



VMM ASIC Power: (1.9 – 3.5) V, 4 x 10 A

→ 76 – 140 W

Rohde&Schwarz HMP4040 | 4 chan. (each 10 A), 384 W