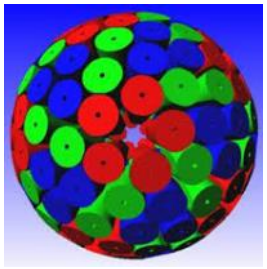
STATUS OF AGATA INFRASTRUCTURE DEVELOPMENTS:

AUTOFILL and LVPS



AGATA infrastructure team at CEA Saclay:

T. JOANNEM, M.KAROLAK, A. LOTODÉ,

C.THEISEN, M. ZIELIŃSKA

AUTOFILL UPGRADE

Current Autofill developed by IRFU (PLC) and GSI: very reliable

BUT it is not possible to keep the current Autofill architecture for AGATA 2π and beyond:

- number of buffer tanks needed (one for 8 ATCs)
- major adaptations needed for each host lab

Need to introduce important modifications (different thresholds for PT100, LN2 level, monitoring of LN2 consumption per ATC…)

A request from AMB (2018) to have a system that can be easily split in two for beyond AGATA 2π

First proposal from Saclay: 2013

Presentation of a more detailed proposal to the collaboration: AGATA Week 2018

April 2019: AGATA collaboration officially approves the proposed Autofill development

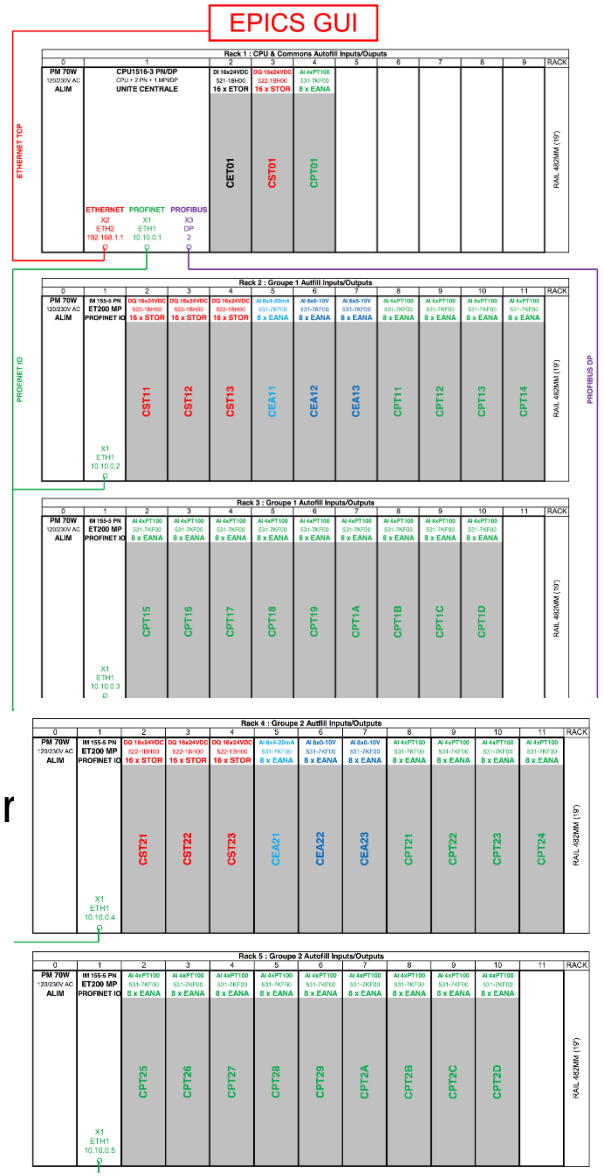
AUTOFILL UPGRADE

One buffer tank for 15 ATCs;
for more than 30 ATCs, these buffer tanks
will be used only for emergency fill (except for GSI)

EPICS is to replace MUSCADE (no longer maintained)

1 rack (2.2m high) for 30 detectors

Estimated time needed:
- development of software and networks = 1.5 man-year
- electrotechnical concept = 3 months
- production monitoring for wiring cabinet + tests
  = 2 months

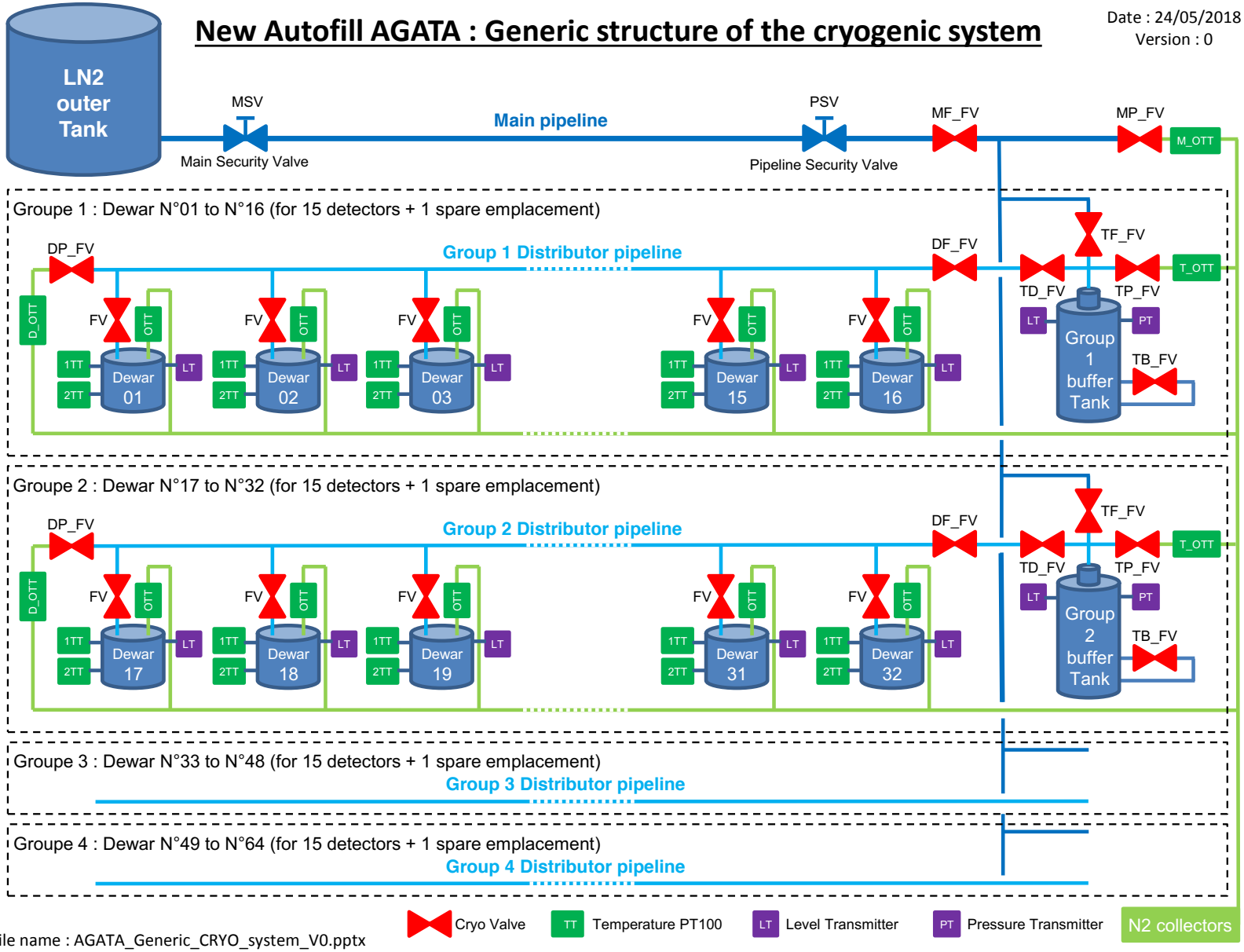


M. Zielińska for CEA/DRF/Irfu AGATA infrastructure team

AUTOFILL UPGRADE

New Autofill AGATA : Generic structure of the cryogenic system

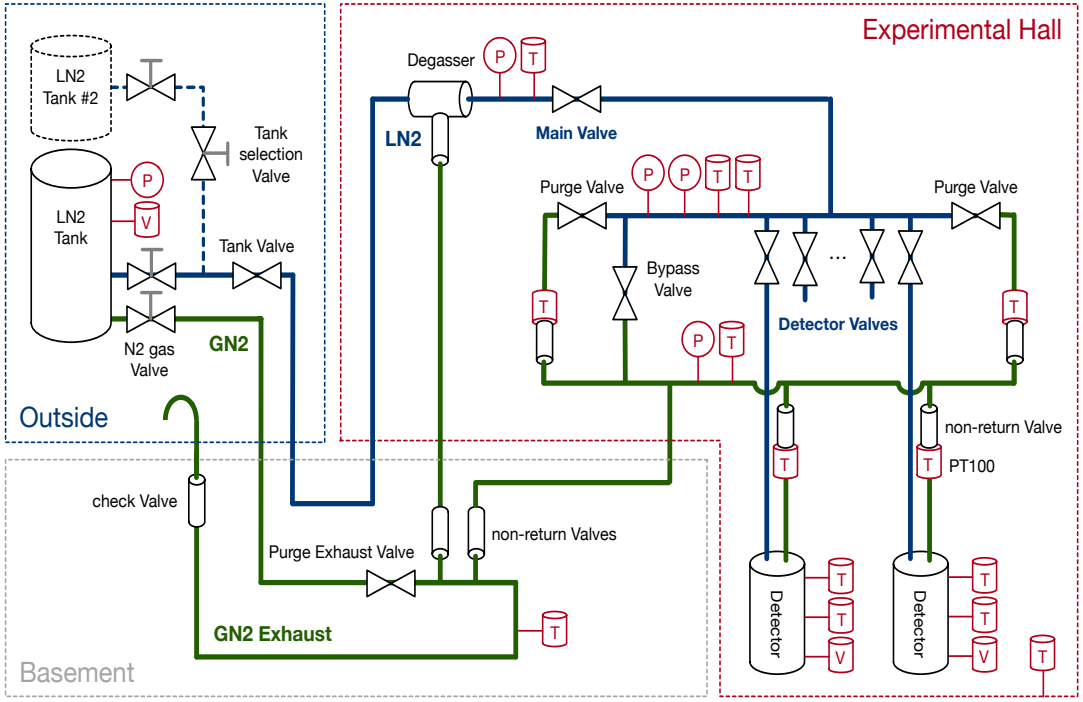
Date : 24/05/2018
Version : 0



File name : AGATA_Generic_CRYO_system_V0.pptx

AUTOFILL FOR LNL CAMPAIGN

Departure from the common architecture:
- new pressure, temperature sensors, analog main valve, new automatic procedures, new GUI
- no buffer tanks, direct filling from external tank
- for safety reasons, number of detectors filled in parallel limited to 4



Design of the cryogenic system (Air Liquide) quasi-finalised in September 2020

Part of the programming work undertaken at IRFU in 2020 became obsolete as it was based on the assumption of common architecture and GANIL filling procedures

AUTOFILL FOR LNL CAMPAIGN

Current status:

PLC:

- 4 man-months needed for PLC development
- no manpower available at IRFU – a subcontractor has been identified and is being hired to work with the IRFU team on this project
- due to the total cost of subcontracting, administrative procedures more complex than anticipated (3-4 months?)

Electrotechnical study:

- started in March 2020 and not completed due to missing information from LNL and subsequent manpower issues at IRFU
- necessary manpower (1.5 man-months) available at IRFU starting March 2021

LVPS UPGRADE

Present LVPS:

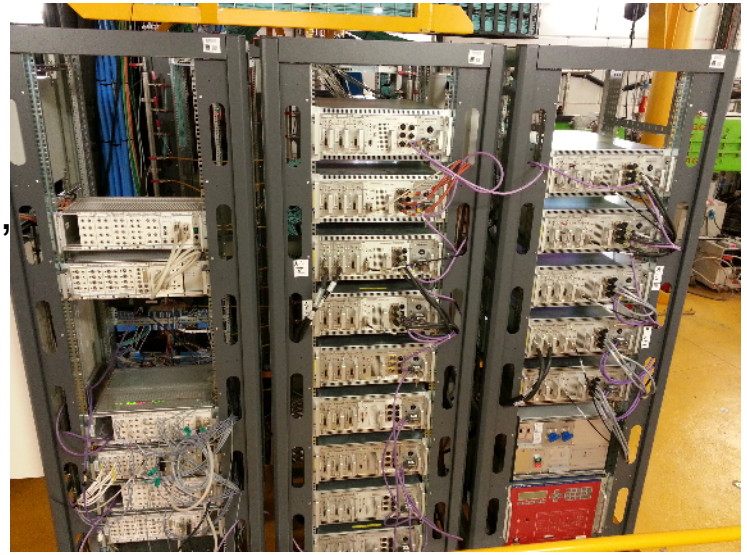
AXIS/IRFU development, very reliable operation

BUT: takes too much space, 6.5 V module not used,

power consumption of new digitisers lower

than that of the first generation

(300W V0, 70W V1, 150W V2)



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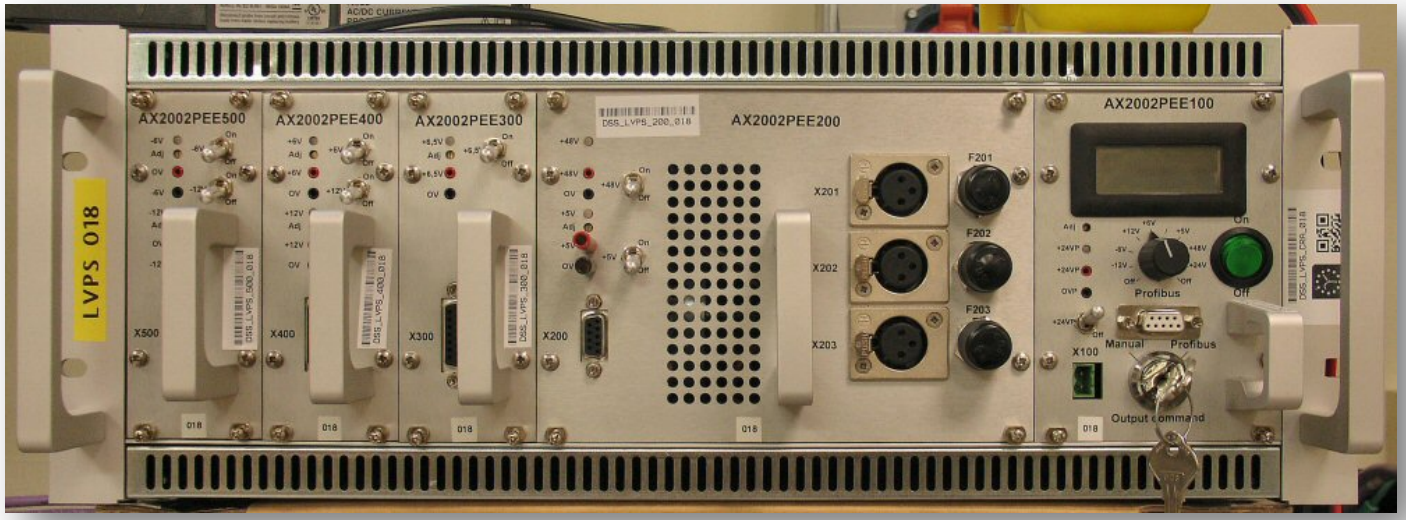
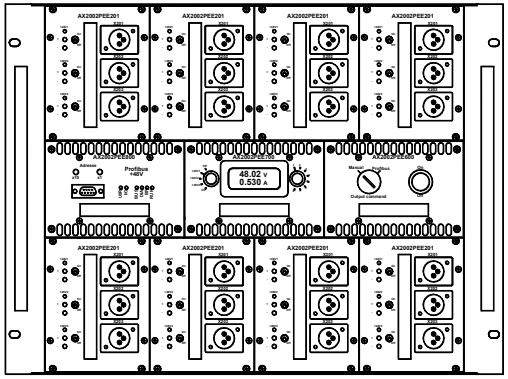


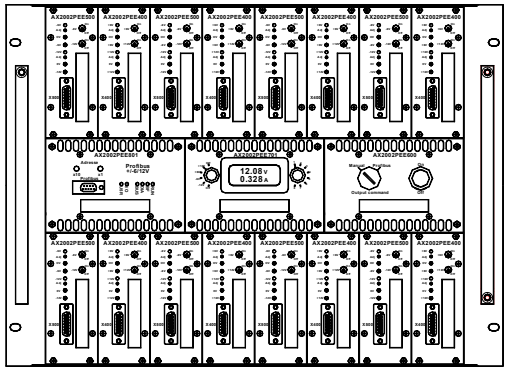
ADOPTED SOLUTION

Separation of crates for 6/12V and 48V power supplies



Passage from linear to switch mode for 48V units

Each crate supplies power for 8 ATCs:
reduction of size by a factor of 2 compared to the old LVPS

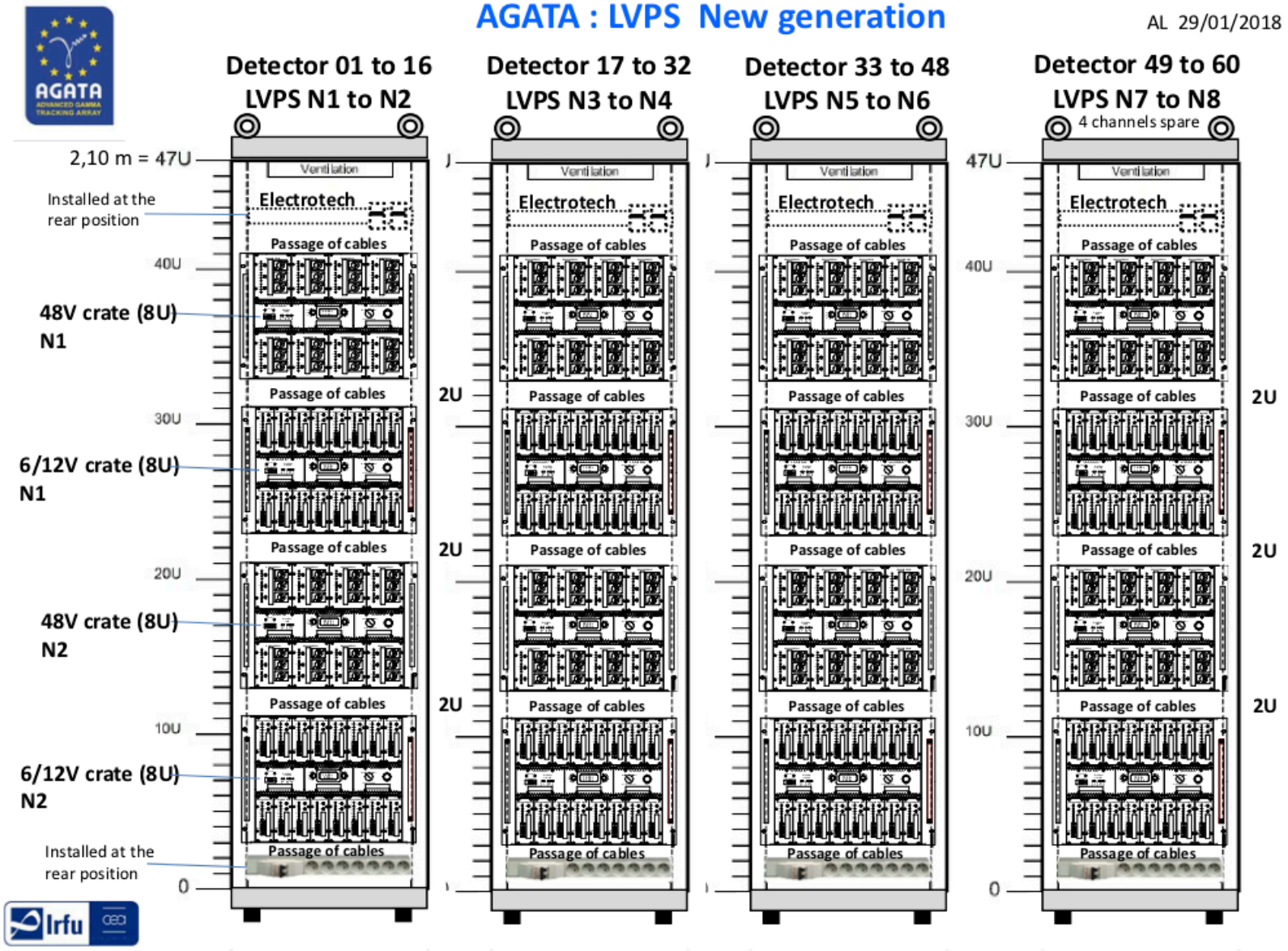


Compatible with V1 and V2 electronics

Prototype ordered in March 2020, currently under tests

Production: 3-4 months after validation of the prototype via tests at Saclay and GANIL

PROPOSED LVPS (AGATA 4π)



NEW LVPS - PROTOTYPE

Complete 48V crate

Complete 6/12V crate

Test bench for 6/12V and 48V

48V crate: delivered in December 2020 for first tests in Saclay. Returned to AXIS for modification and tests with the test bench.

6/12 crate: under tests at AXIS, thermal problem identified and being solved

Test bench: operational. Software for tests at IRFU under development.

Delivery of both crates and test bench to Saclay expected end of February

OTHER RECENT ACTIVITIES

Existing LVPS:

Refurbishment of all units (18 in total) undertaken by AXIS in two batches

(July and December 2020).

As the units were in use at three labs (GANIL, IKP et Saclay) transport arrangements had to be made. Intervention completed without powering down of the detectors in the array, in a close collaboration with GANIL.

Patch boxes:

Tests at IRFU of 12 Patch boxes ordered by INFN

Cabling:

40 cables 6/12V and 45 cables 48V are being tested at IRFU prior to shipment to LNL