

DE LA RECHERCHE À L'INDUSTRIE



GAS RACK DESIGN AND GAS COMPONENTS

**DOCUMENT: GAS BOX DESIGN
ESS NEUTRONS BEAM LOSS MONITOR
VERSION 1.0**

Q. Bertrand

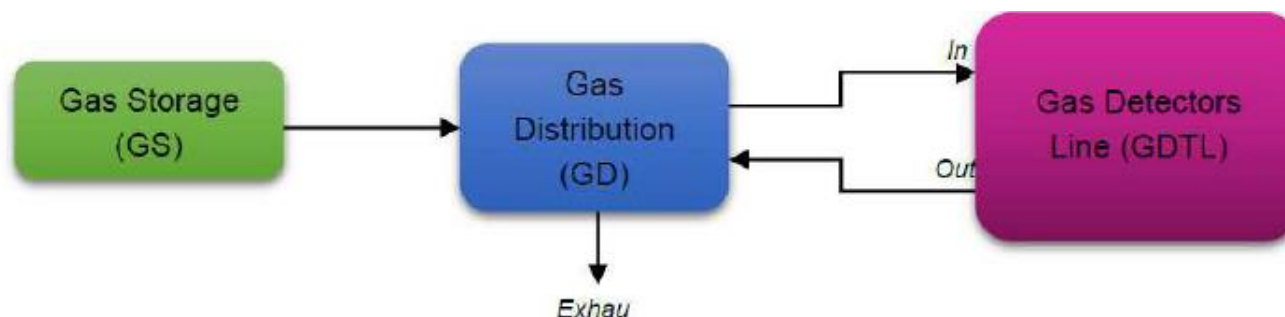
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On behalf of Q. Bertrand

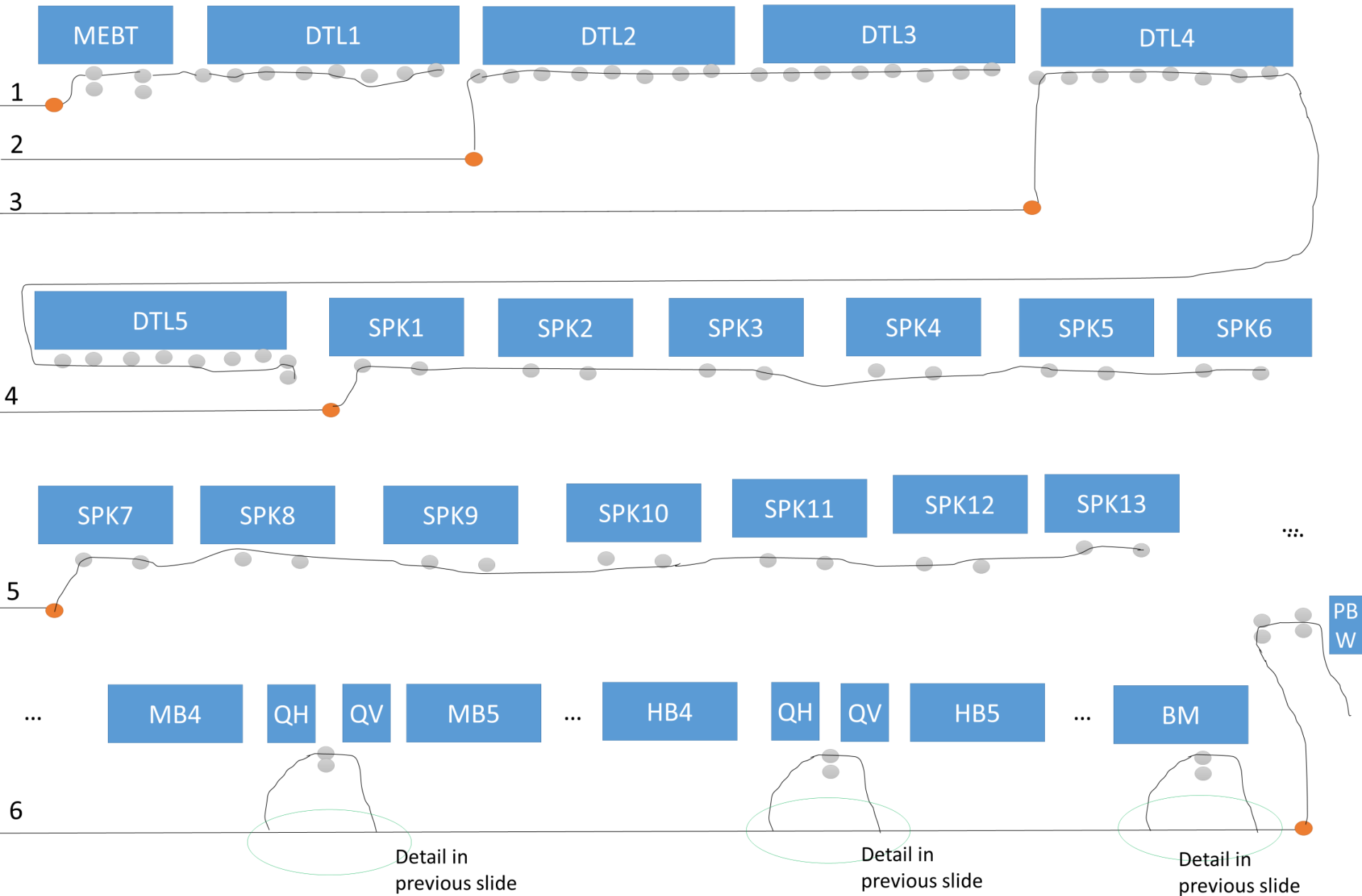
12/08/2018

- 6 group of detectors
- 6 Input lines + 6 output lines
- Max. number of detector per line ~18
- 4-6 h of recirculation of gas needed
- Except in last E part (~20h)
- **Last tube 600 m tube for only 10 detectors!!**
- No Patch panels

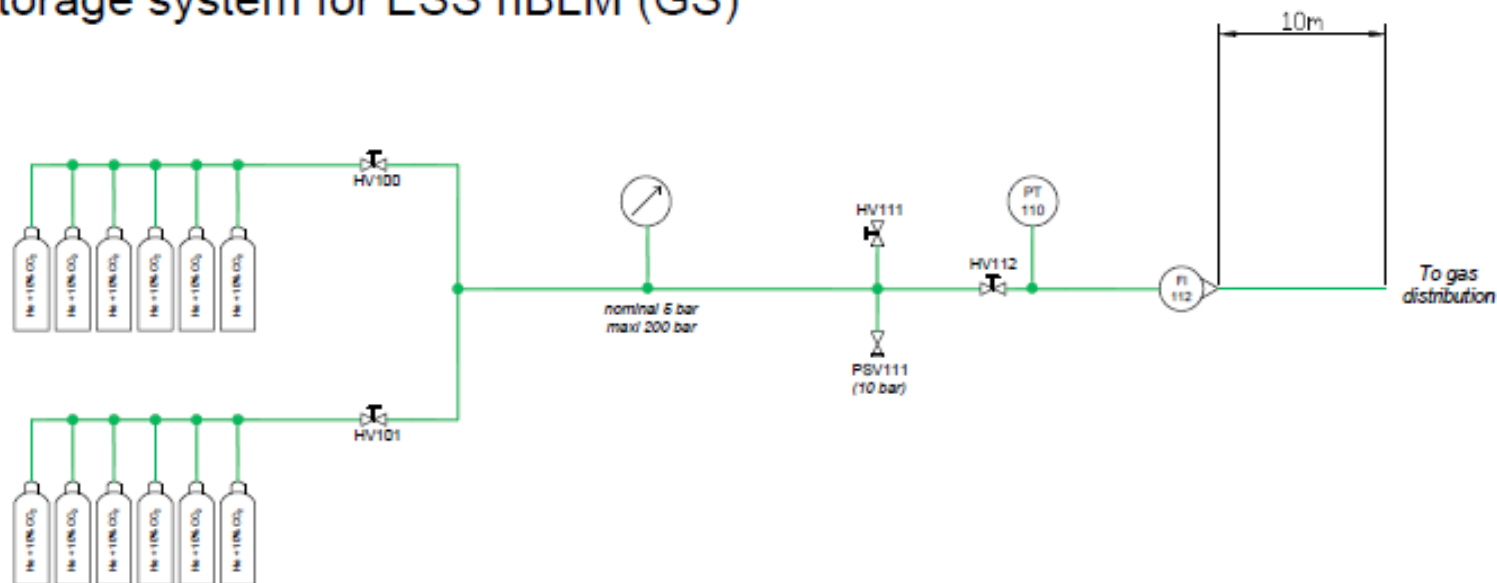
Gas line	Detectors in	Number of detectors
Line 1	MEBT-DTL1	12
Line2	DTL2+ DTL3	8 + 8 = 16
Line 3	DTL4 + DTL5	8 + 8 + 2 = 18
Line4	SPK1-6	12 + 2 = 14
Line 5	SPK7-13	14
Line6	MB-HB + Bend Magnet	2 + 2 + 6 = 10



IN LINES



Gas storage system for ESS nBLM (GS)



— Gas in (6/8mm)
— Input DTL line (6/8mm)
— Output DTL line (6/8mm)
— Detectors
— Gas out

>> Fast connector
 Pressure overpressure valve
 Hand valve
 Control valve
 Electro valve

 Flow indicator
 Measuring pressure
 Manometer
 Flow measurement

Instrumentation schema for gas storage system

ESS nBLM

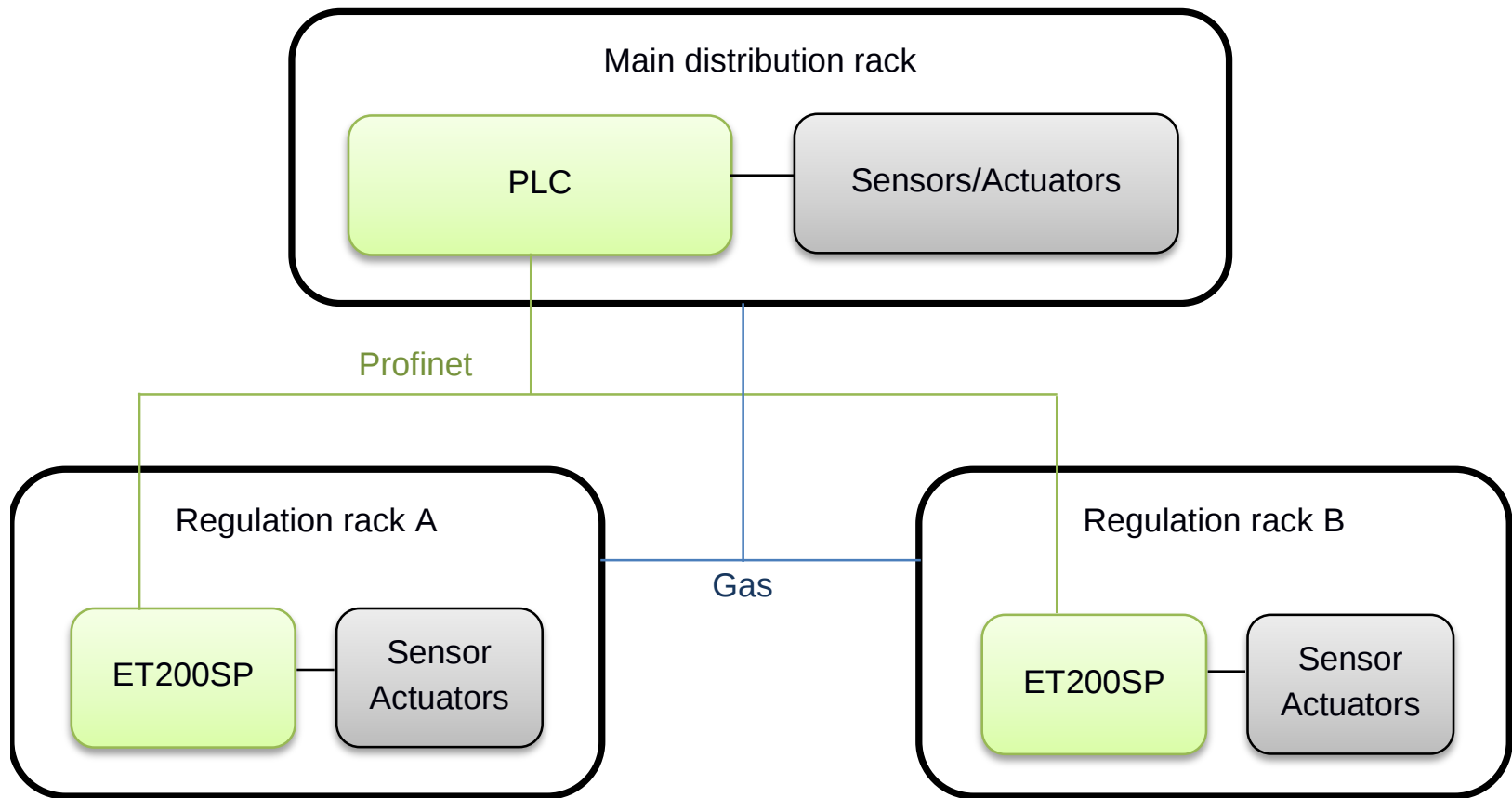
V04

Edition
24/01/2018

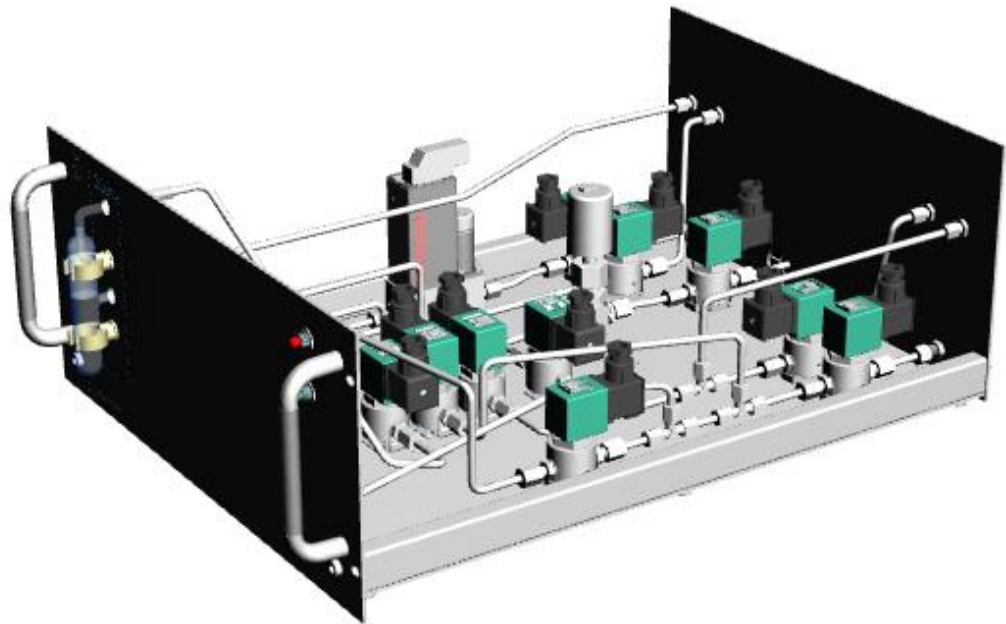
Dessiné par
Q.Bertrand

The ESS nBLM gas system control is composed of four main parts:

1. A main distribution rack unit, to supply the three regulation rack
2. A first regulation unit rack for:
 - Line 1 (MEBT-DTL1)
 - Line 2 (DTL2-DTL3)
 - and line 3 (DTL4-DTL5)
3. A second regulation unit rack for:
 - Lines 4 (SPK1-6)
 - Line 5 (SPK7-13)
 - and line 6 (MB-HB-Bend Magnet)
4. A spare unit rack, for maintenance



Example of gas rack unit
(Not final design
implemented)



Mesure
Régulation

Débit Gaz
Débit Liquide

Pression
Vide

Études
Procédés

Solutions
Pilotes

Évaporation
Dilution

Métrologie
Services



**SERV'
INSTRUMENTATION**
Mesure et Contrôle vos fluides

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et activités
de la société

Produits
et panorama
des offres

Offre package
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« Ready »

Réalisation
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Contrôle
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et supervision

**Applications
techniques,
références**

Centres
de services
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Applicatifs Techniques

- Caractérisation D/P/T*
- Régulation D/P/T
- Humidification des gaz
- Mélange des gaz
- Dilution des gaz (ppm à ppb)
- Contrôle d'Étanchéité
- Gaz toxiques et corrosifs
- Échantillonnage des gaz
- Analyse physico-chimique
- Contrôle point de rosée
- Évaporation directe des liquides
- Atomisation des liquides
- Génération précurseurs liquides
- Génération/mélange polluants
- Bullage régulé en D/P/T
- Traitement Sodium
- Carbonatation et Pulvérisation
- Banc moteur
- Réacteur de procédé

* D/P/T = Débit/Pression/Température

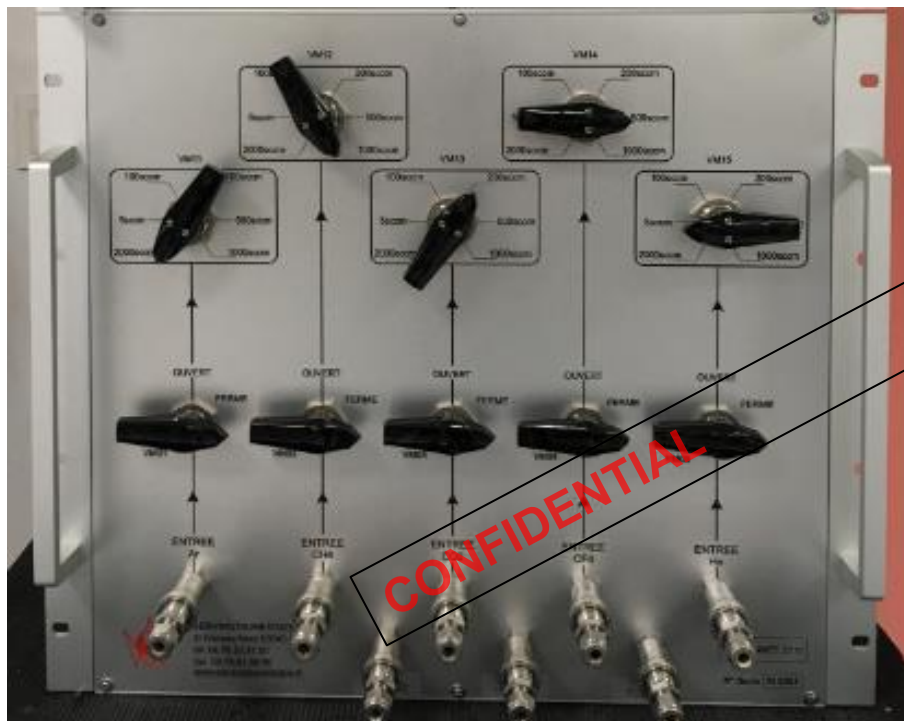
Activités R&D et Production



Références

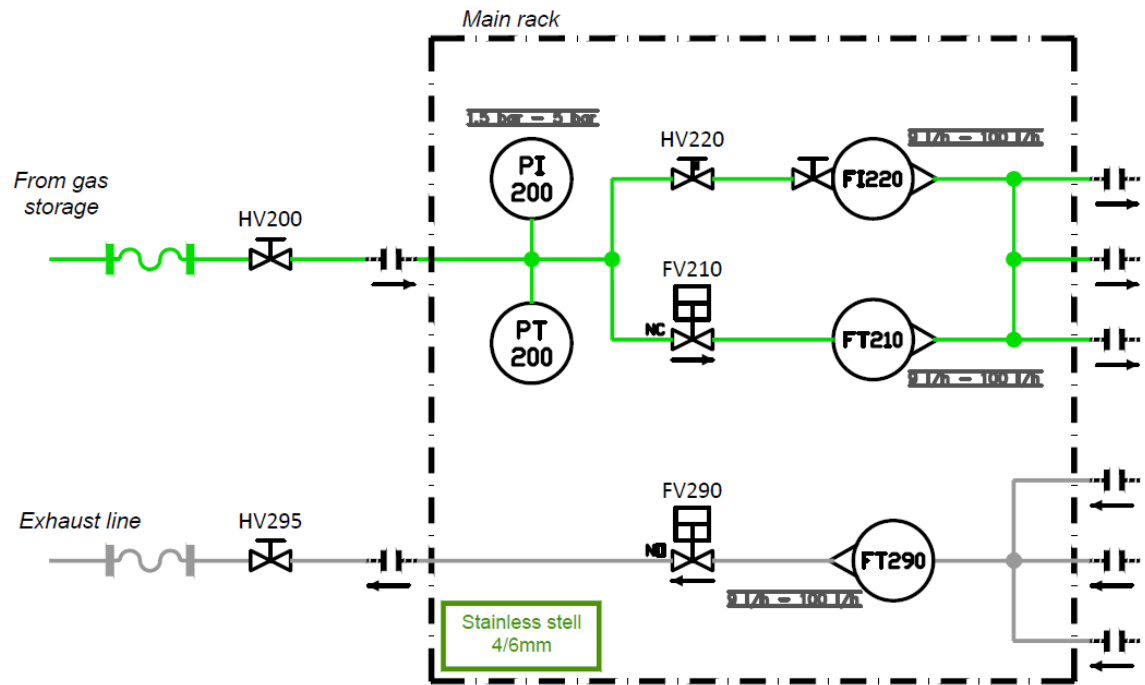


EXEMPLES DE REALISATIONS



3.1 Main distribution rack

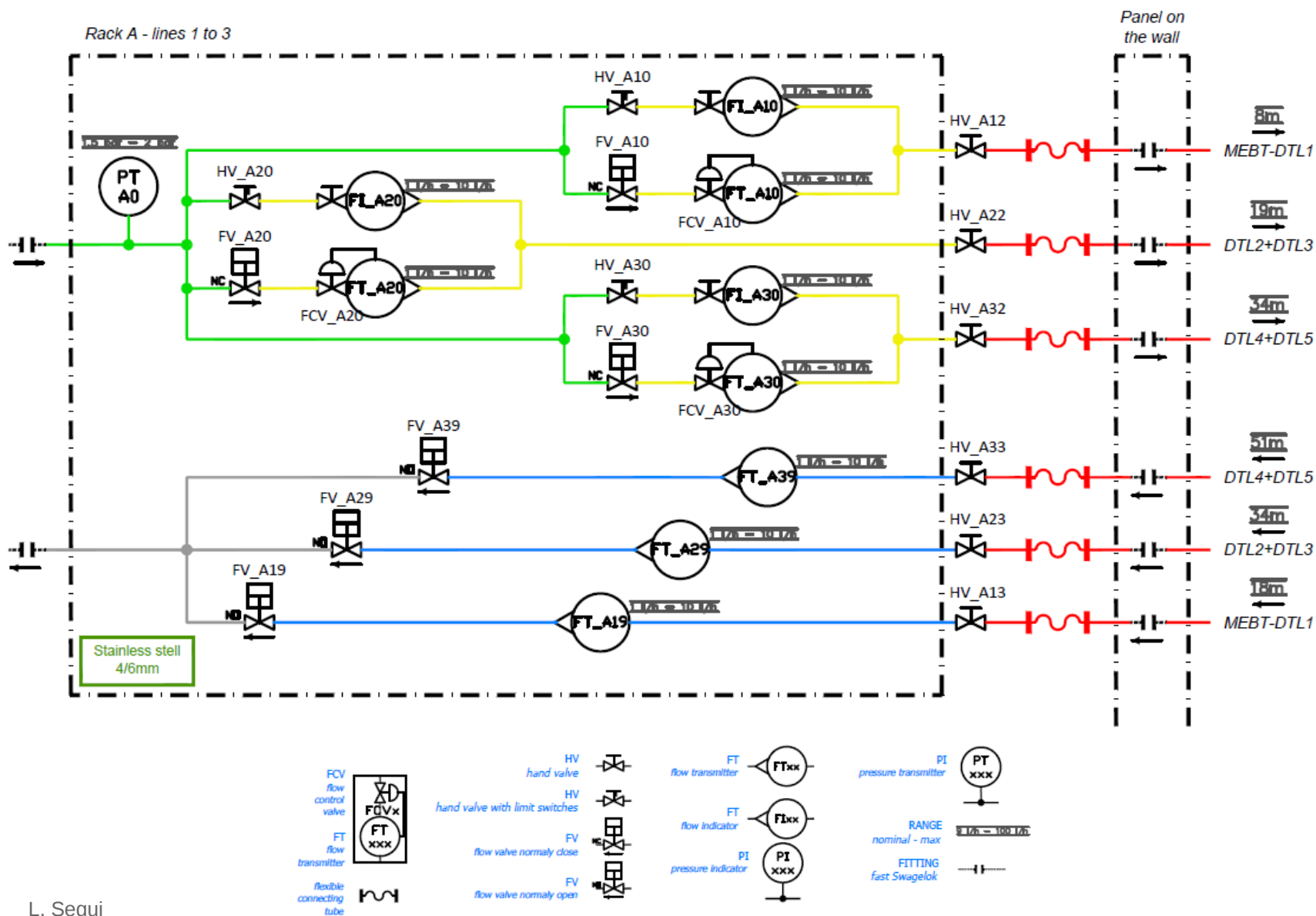
- Two manual valves from IN and OUT lines
- A pressure indicator (manometer) to limit the input pressure manually
- A pressure sensor which is connected to the PLC
- A manual line, with hand valve (and limits switches) and manual flowmeter to supply the distribution racks if the automatic line is out of order.
- An automatic line, with electro-valve (Normally close) and flowmeter
- A return line, with flowmeter and electro-valve (Normally open)



3.1 Main distribution rack

Device name	Schematic name	Hardware reference	Number
Manometer	PI200	WIKA-2333RV	1
Pressure sensor	PT200	KELLER-PAA23SY	1
Hand valve	HV220	HYLOK-B2VAH-6M	1
Flow indicator	FI220	BROOKS-GT1350-I-VD2	1
Electro valves	FV210-FV290	ASCO-E262K185	2
Flowmeter	FT210-FT290	BROOKS-SLA5850S	2
Self-sealing connection		SERTO CO KA/B-SOSC-6EV	8

3.2 Distribution racks



3.2 Distribution racks



Device name	Schematic name	Hardware reference	Number Per rack	Total
Pressure sensor	PTA0	KELLER-PAA23SY	1	3
Hand valve with limits switches	HV_A10-HV_A20-HV_A30	HYLOK-B2VAH-6M	3	9
Flow indicator	FI_A10-FI_A20-FI_A30	BROOKS-GT1350-I-VD2	3	9
Electro valves	FV_A10-FV_A20-FV_A30 -FV_A19-FV_A29-FV_A39	ASCO-E262K185	6	18
Flowmeter with valves	FT_A10-FV_A20-FV_A30 FCV_A10-FCV_A20-FCV_A30	BROOKS-SLA5850S	3	9
Flowmeter	FT_A19-FT_A29-FT_A39	BROOKS-SLA5850S	3	9
Hand valves	HV_A12-HV_A22-HV_A32 HV_A13-HV_A23-HV_A33	HYLOK-B2VAH-6M	3	9
Self-sealing connection		SERTO CO KA/B-SOSC-6EV	2	6