

Electrical wiring for piezo movers

piezo power supply
strain gauges readout
temperature probes

Overview : the way to connect from IP chamber to control room :

- piezo movers (power supply and strain gages readout),
- temperature probes.

Overview by flange : the wiring on the flange :

- inside the IP chamber,
- outside.

Detail for the 2 flanges : an example of a equipped flange :

- vacuum connectors,
- equipped flange with feedthroughs,
- external connectors and cables.

Overview of the existing at LAL : LAL wiring uses to perform tests of piezo movers :

- piezo movers,
- movers command box,
- inputs / outputs electronics,
- laptop with NI Labview software.

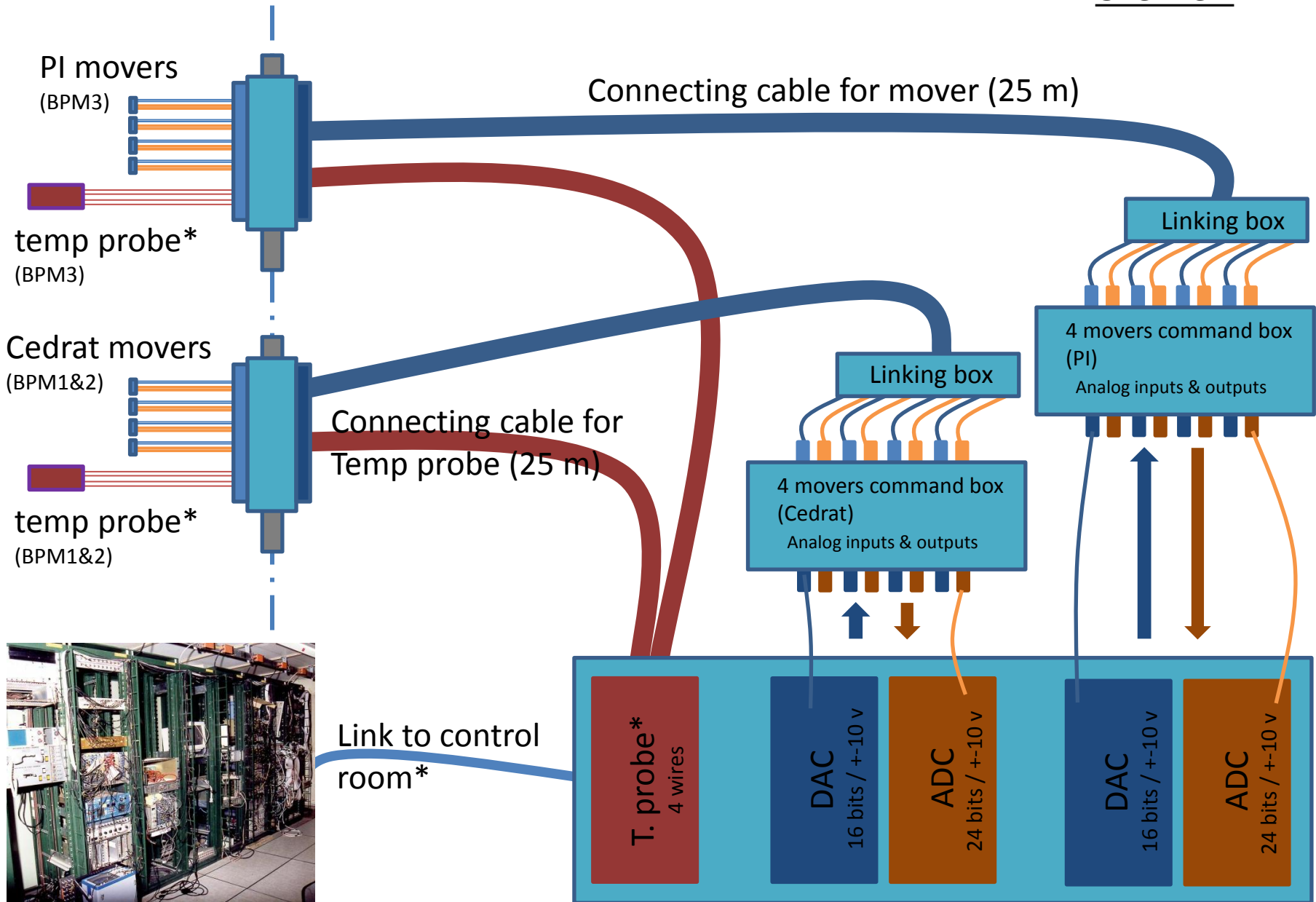
Existing ADC / DAC : equipment bought and used by LAL :

- National Instruments (NI) modules,

The LAL need at KEK : necessary equipment to connect LAL electronics to KEK control room :

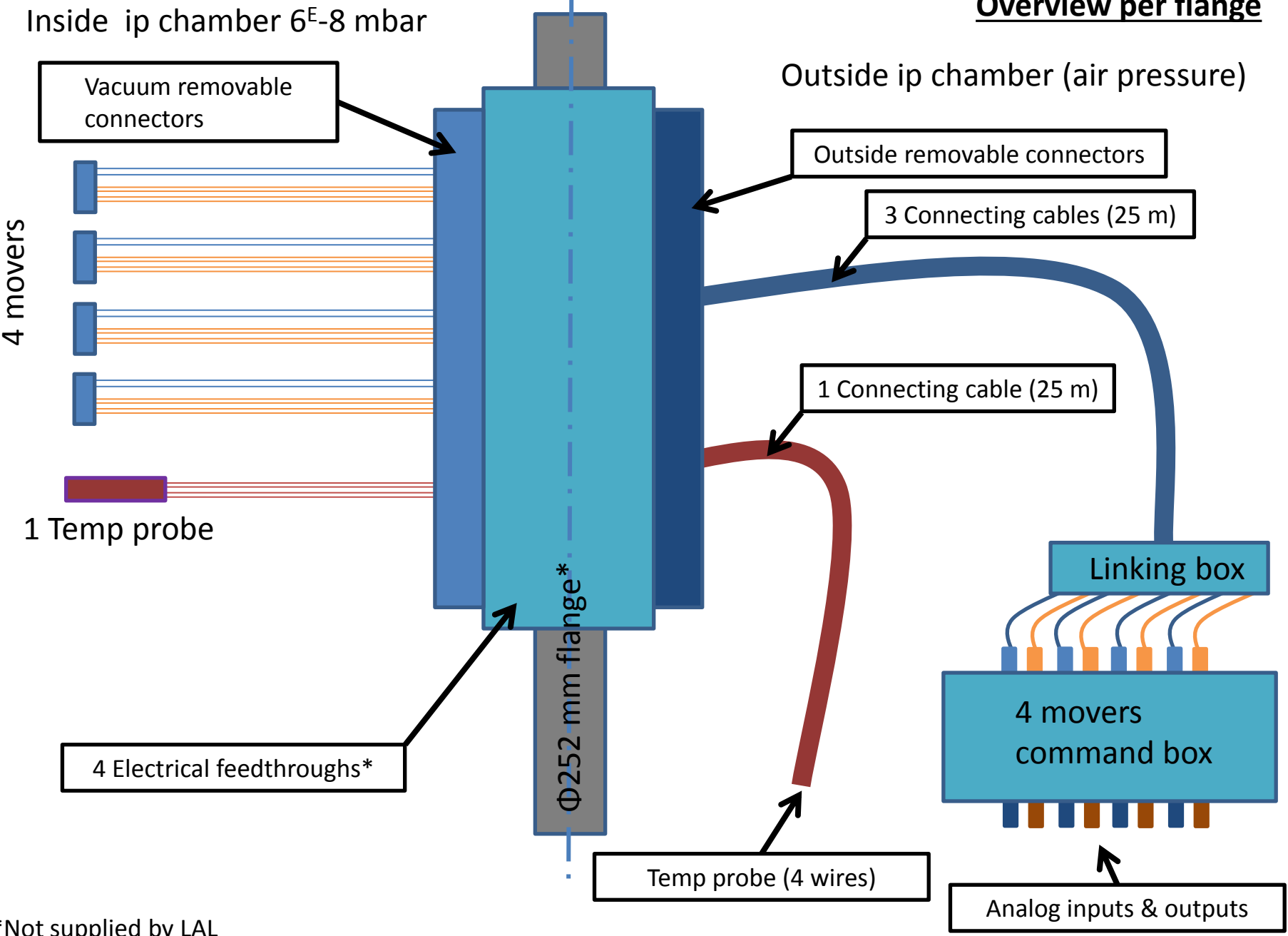
- an example given by National Instruments (NI) modules.

Conclusion



* To be defined

Overview per flange



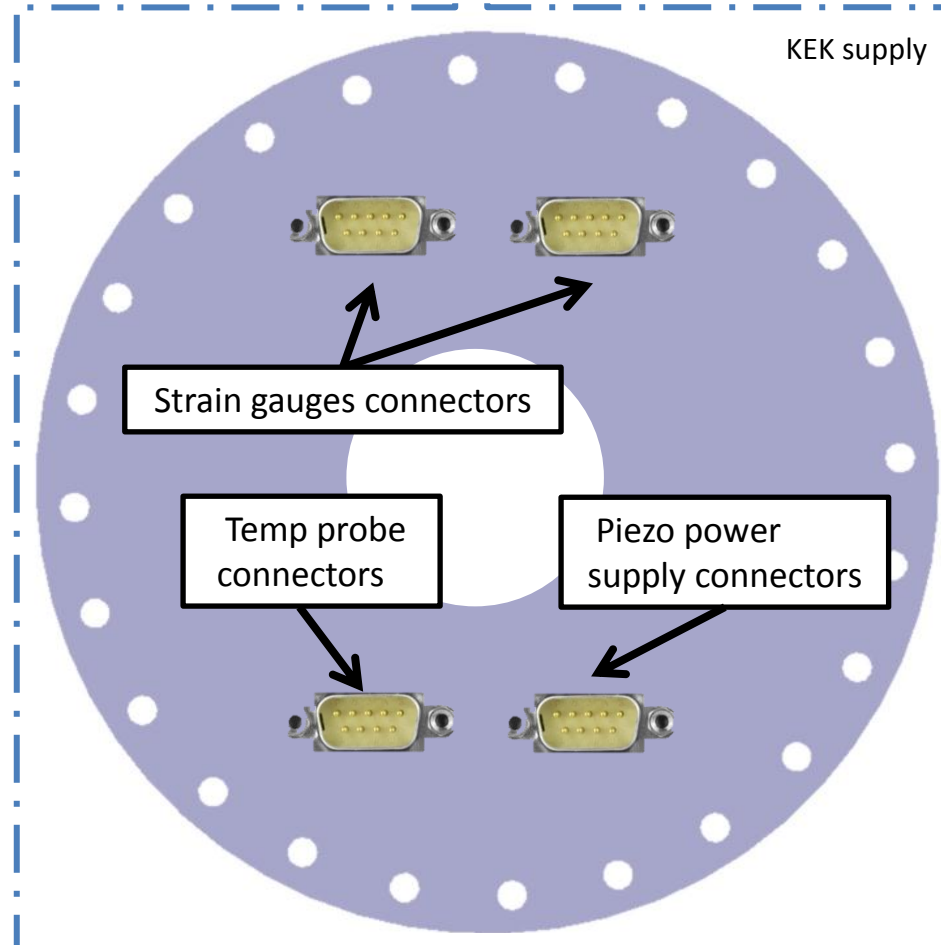
*Not supplied by LAL

Detail for the 2 flanges

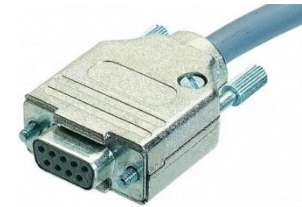
Inside ip chamber 6^E-8 mbar

Outside ip chamber (air pressure)

2x4 Connectors subD9 female (Ceramic UHV)
Small crimp pins



2x 4x25m
'7 S/FTP' cable



2x4 Connectors subD9 female
2x4 metal covers subD9

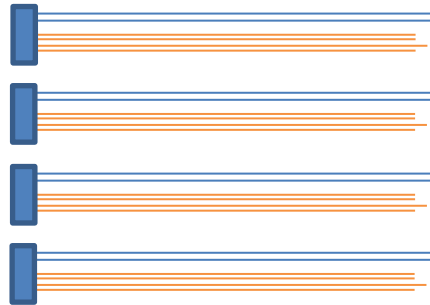
2x1 flange with 4 feedthroughs subD9 male for each flange
(feedthroughs position on the flange surface : KEK discretion)

Thanks to

P.Cornebise SERDI-LAL



PI movers
(BPM3)

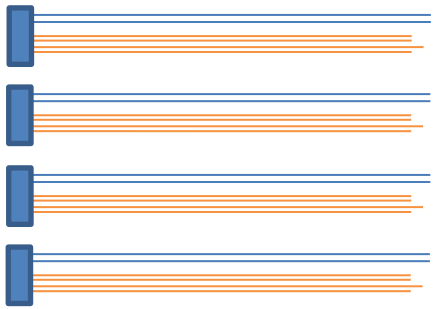


Welding wire to wire

2 wires (piezo power supply)

4 wires (strain gauges readout)

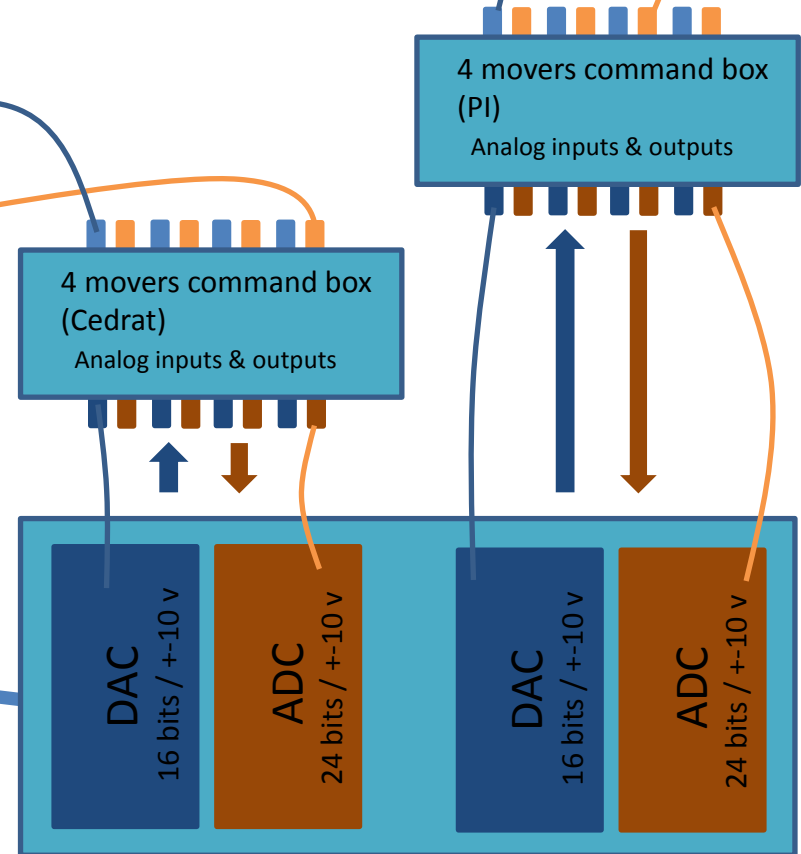
Cedrat movers
(BPM1&2)



Welding wire to wire



USB link



USB link
for Labview interface



Rack for 4 modules
NI cDAQ 9174

PI mover
(x4)

2 wires (piezo power supply)

4 wires (strain gauges readout)

Cedrat
mover (x4)

2 wires (piezo power supply)

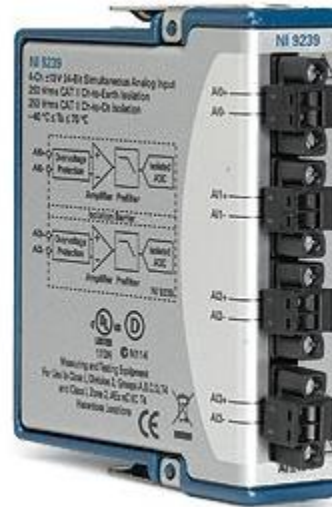
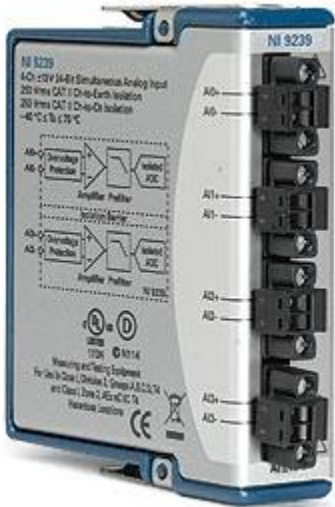
4 wires (strain gauges readout)

ADC module
24 bits / +-10V (input x4)

DAC module
16 bits / +-10V (output x4)

ADC module
24 bits / +-10V (input x4)

DAC module
16 bits / +-10V (output x4)



NI 9239

NI 9263

NI 9239

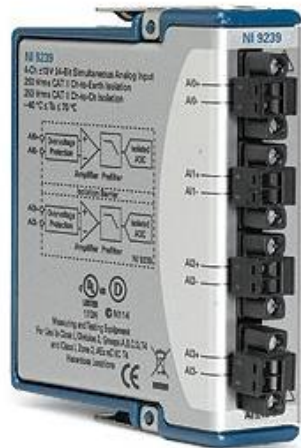
NI 9263

Ethernet / RS432-485 / ...
link to connect with KEK
control room



For example

Output : DAC
piezo power supply
16 bits / +-10Vc (input x4)



x2

Input : ADC
strain gauges readout
24 bits / +-10V (input x4)



x2

Input : ADC
Temp probe readout
(PT100 / PT1000) (input x4)



x1

These electronic modules must be connected to the control room devices at KEK. No preference for National Instruments (NI), Keyence...

Distance from IP chamber (warm zone) to movers / temp probes electronics (cold zone) :

- 25 m.

Temperature probes :

- need inside IP chamber ? How many (1 for BPM1&2 / 1 for BPM3) ?
- heating wire wound around the chamber to maintain constant the temperature ? KEK ?

Flanges supply :

- flanges with feedthroughs to be supplied by KEK ?
- subD9 male feedthrough as purposed by LAL ?

Electronics to connect to control room devices :

- LAL supply with NI modules and Labview software ?
- or KEK supply with LAL specs ?
- USB / RS 485 / ethernet link ?