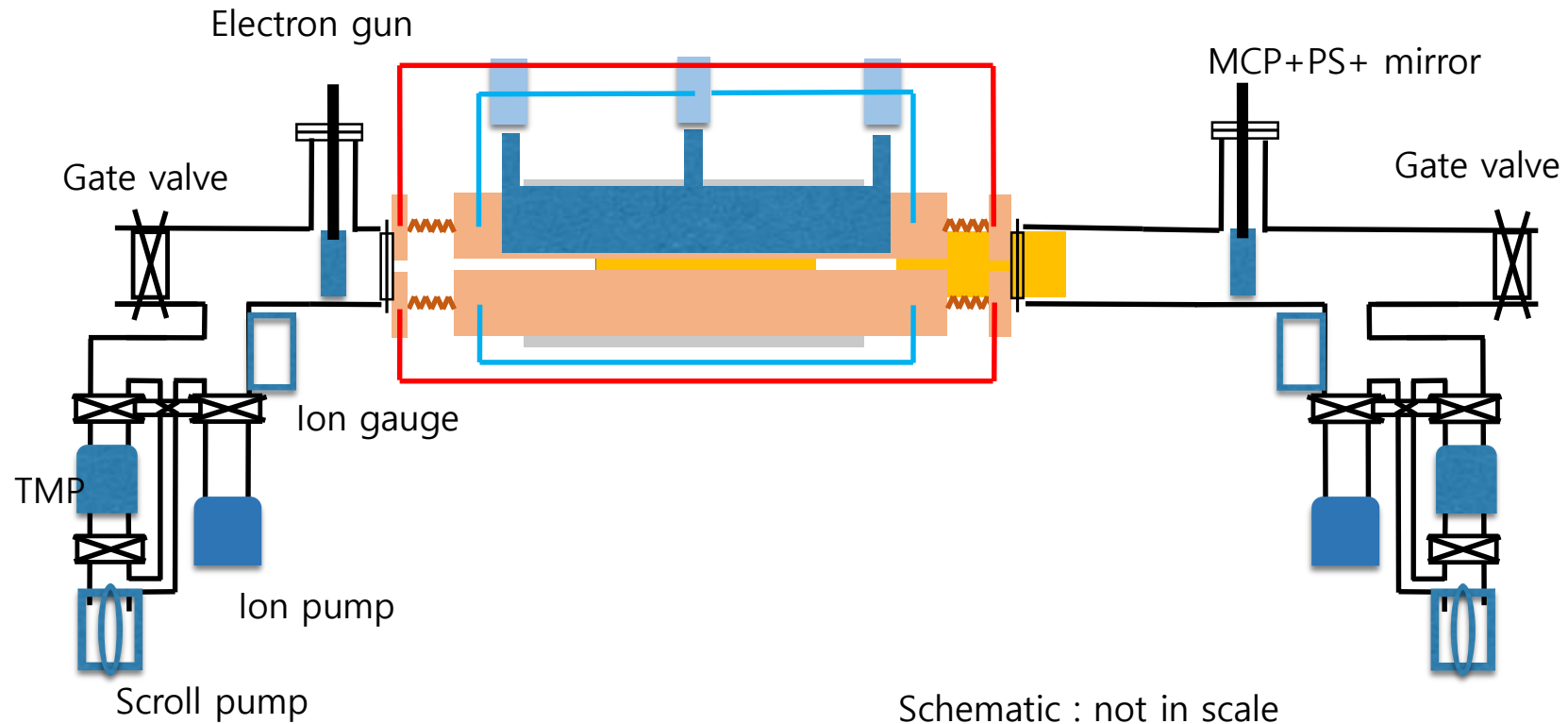


# Vacuum System Test for GBAR antiproton trap

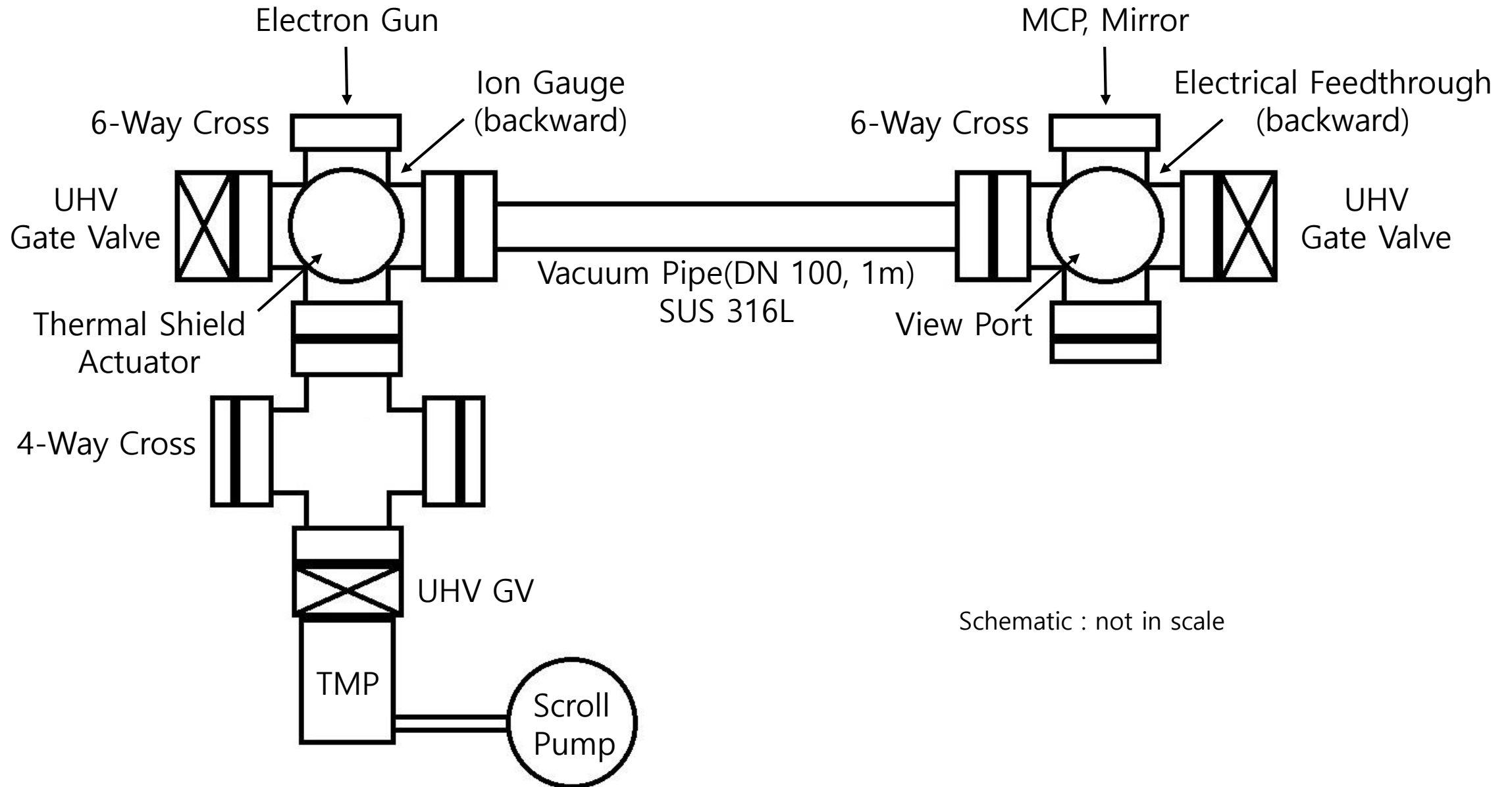
Seoul National University

25.May.2017

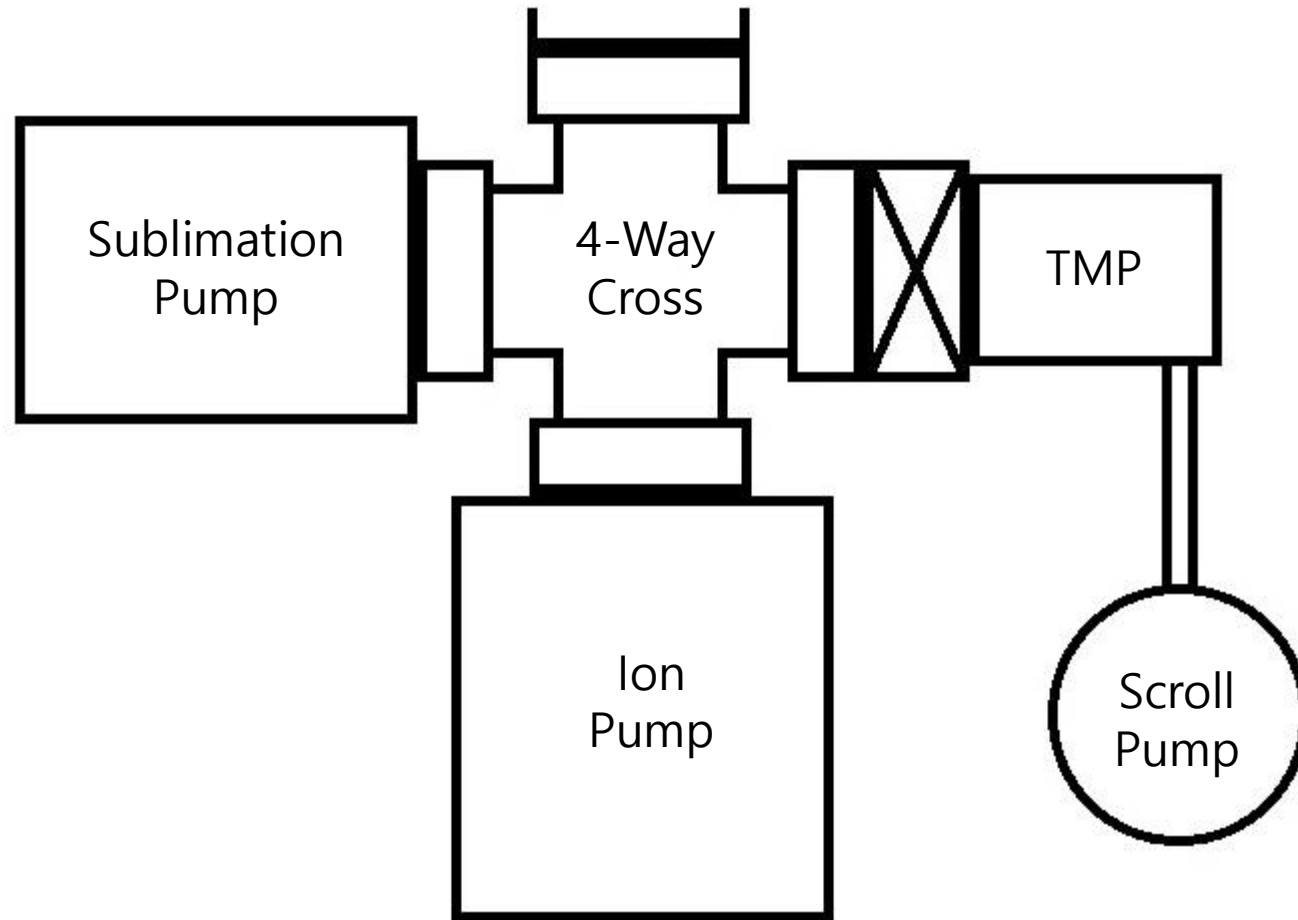
# GBAR antiproton trap-Vacuum



# Vacuum System Test

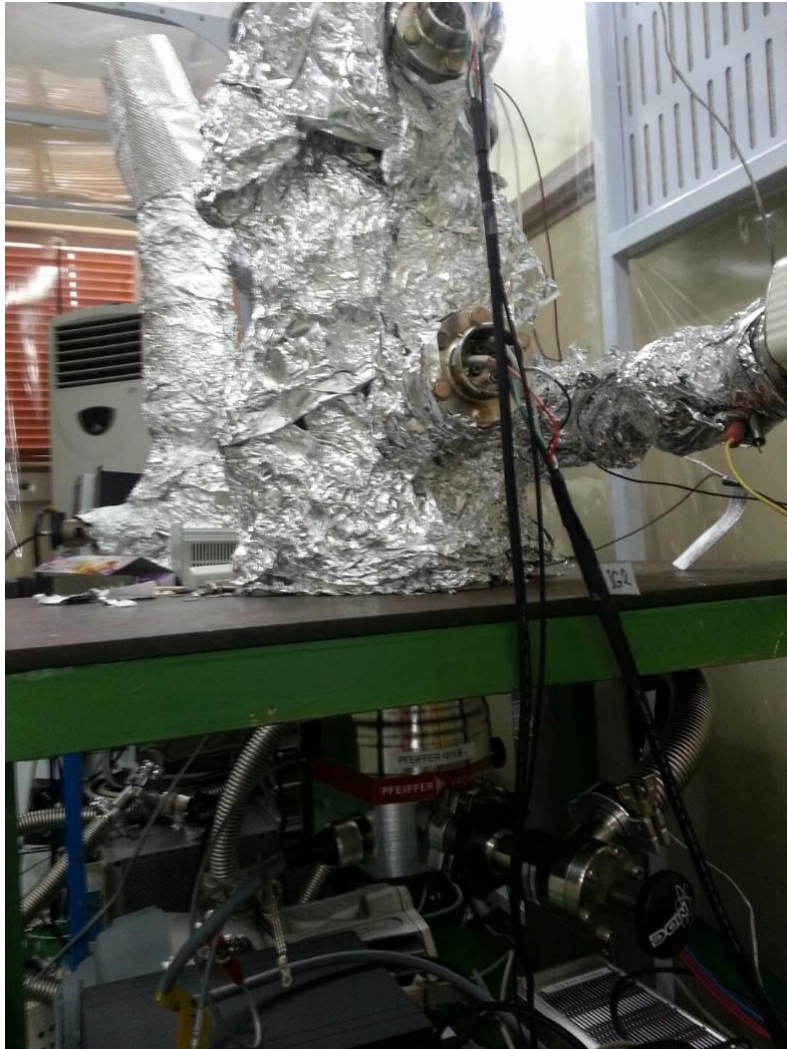


## 4-Way Cross When Using Ion Pump

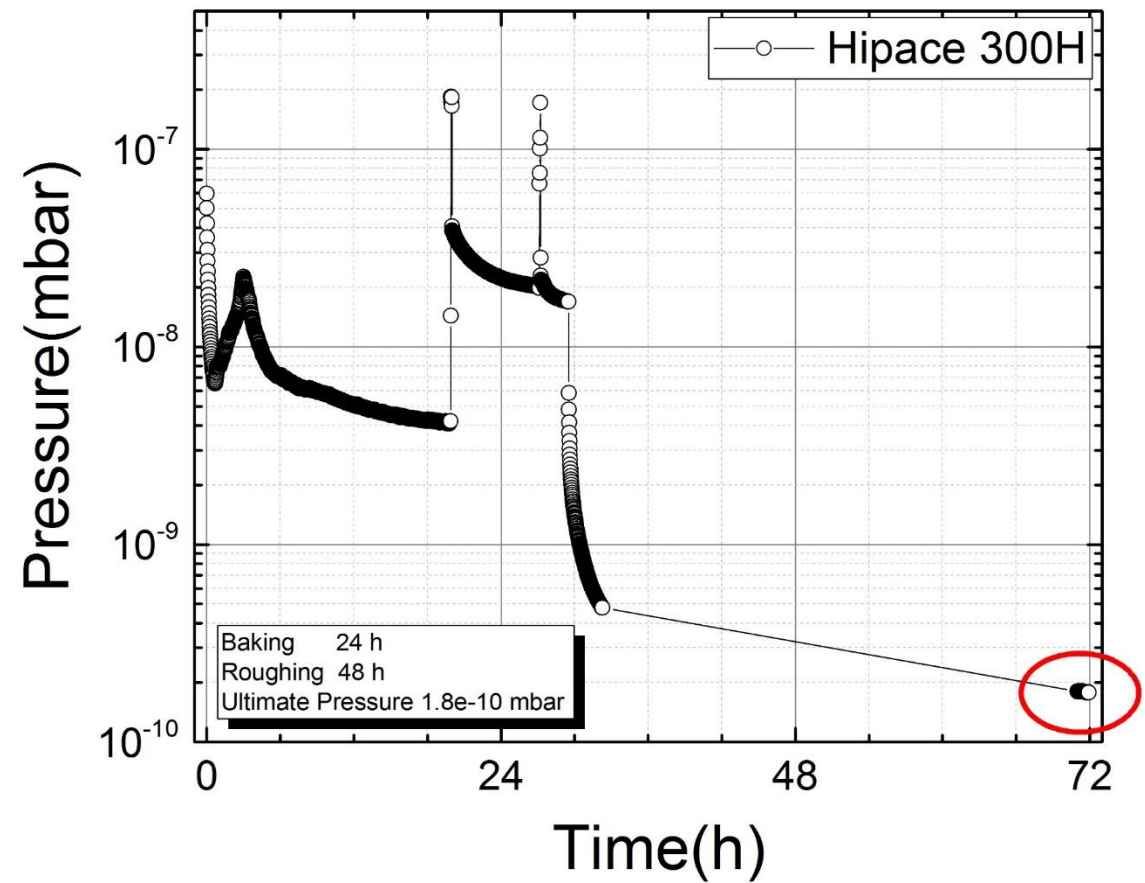


- The pressure we want to make is  $10^{-9} \sim 10^{-10}$  Torr in room temperature.
- We ordered TMP, Scroll pump, Ion gauge on March.
- TMP : Pfeiffer HIPACE 300H
- Scroll pump : Agilent SH-110
- Ion-gauge : UHV-24p
- Material of the system : SUS 316LN – Magnetization Problem.
- Ordered drawing and making to Jung-Min Sil Up

# HIPACE 300H

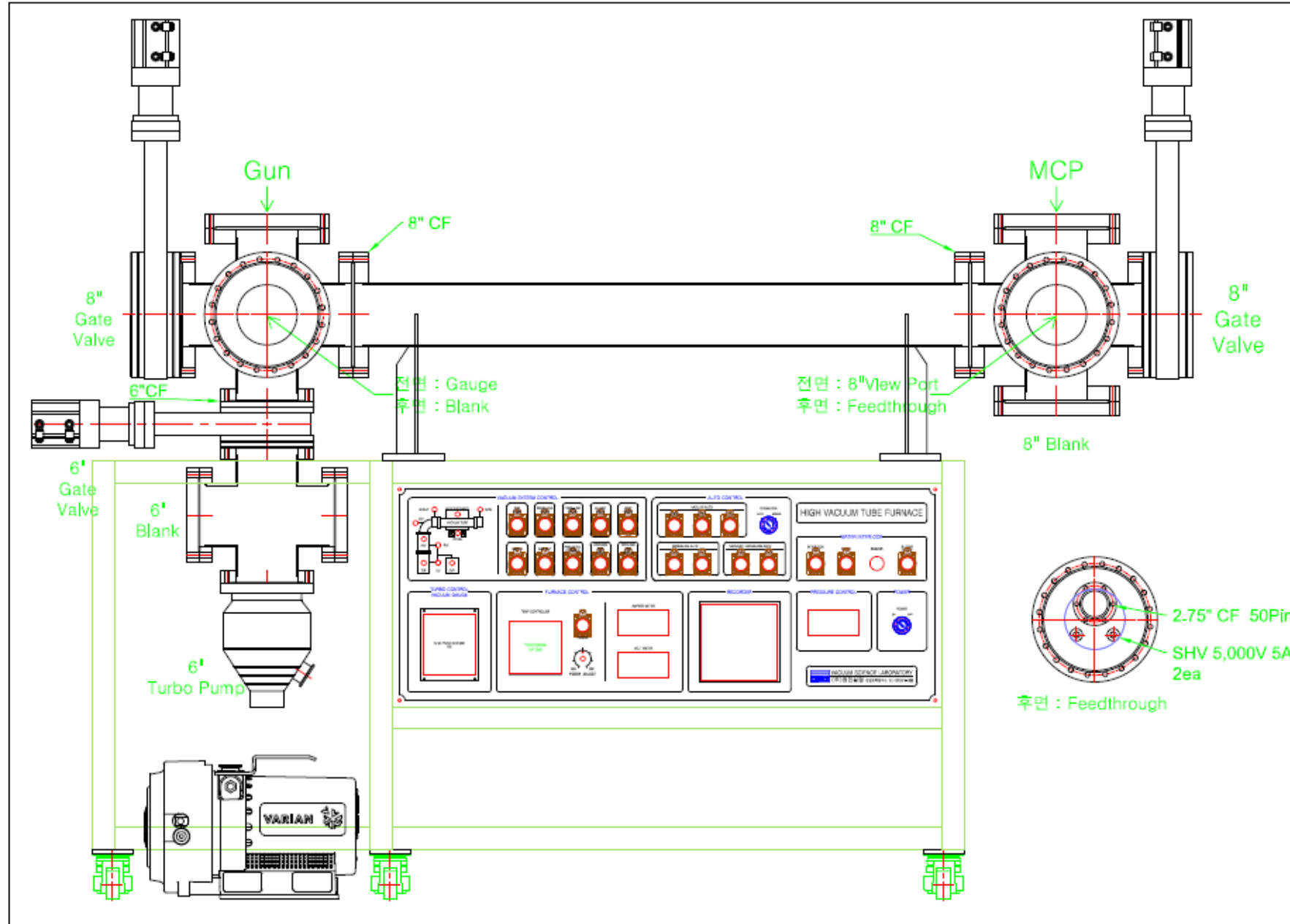


## Pohang Accelerator Lab



| HiPace 300 H                                               | DN 100 ISO-K               | DN 100 CF-F                 | DN 100 ISO-F               |
|------------------------------------------------------------|----------------------------|-----------------------------|----------------------------|
| Flange (in)                                                | DN 100 ISO-K               | DN 100 CF-F                 | DN 100 ISO-F               |
| Flange (out)                                               | DN 16 ISO-KF / G 1/4"      |                             |                            |
| Venting connection                                         | G 1/8"                     |                             |                            |
| Pumping speed for Ar                                       | 255 l/s                    |                             |                            |
| Pumping speed for H <sub>2</sub>                           | 220 l/s                    |                             |                            |
| Pumping speed for He                                       | 255 l/s                    |                             |                            |
| Pumping speed for N <sub>2</sub>                           | 260 l/s                    |                             |                            |
| Rotation speed ±2%                                         | 60,000 min <sup>-1</sup>   |                             |                            |
| Run-up time                                                | 3 – 3.5 min.               |                             |                            |
| Gas throughput at full rotational speed for Ar             | 0.5 hPa l/s                |                             |                            |
| Gas throughput at full rotational speed for H <sub>2</sub> | 10 hPa l/s                 |                             |                            |
| Gas throughput at full rotational speed for He             | 3.5 hPa l/s                |                             |                            |
| Gas throughput at full rotational speed for N <sub>2</sub> | 1.5 hPa l/s                |                             |                            |
| Compression ratio for Ar                                   | > 1 · 10 <sup>13</sup>     |                             |                            |
| Compression ratio for H <sub>2</sub>                       | 1 · 10 <sup>7</sup>        |                             |                            |
| Compression ratio for He                                   | 2.5 · 10 <sup>9</sup>      |                             |                            |
| Compression ratio for N <sub>2</sub>                       | > 1 · 10 <sup>13</sup>     |                             |                            |
| Fore-vacuum max for Ar                                     | 25 hPa                     |                             |                            |
| Fore-vacuum max for H <sub>2</sub>                         | 15 hPa                     |                             |                            |
| Fore-vacuum max for He                                     | 28 hPa                     |                             |                            |
| Fore-vacuum max for N <sub>2</sub>                         | 30 hPa                     |                             |                            |
| Ultimate pressure according to PNEUROP                     | < 1 · 10 <sup>-7</sup> hPa | < 1 · 10 <sup>-10</sup> hPa | < 1 · 10 <sup>-7</sup> hPa |
| Weight                                                     | 5.8 – 6.2 kg               | 7.8 – 8.2 kg                | 6.1 – 6.5 kg               |
| Cooling method, standard                                   | Air                        |                             |                            |
| Cooling method, optional                                   | Water                      |                             |                            |
| Cooling water consumption                                  | 50 l/h                     |                             |                            |
| Cooling water temperature                                  | 15 – 35 °C                 |                             |                            |
| Interfaces                                                 | RS-485, Remote             |                             |                            |
| Protection category                                        | IP54                       |                             |                            |
| Permissible magnetic field max.                            | 5.5 mT                     |                             |                            |
| Sound pressure level                                       | ≤ 50 dB (A)                |                             |                            |
| Mounting orientation                                       | in any orientation         |                             |                            |
| Operating voltage                                          | 24 V DC                    |                             |                            |

# Vacuum System Test



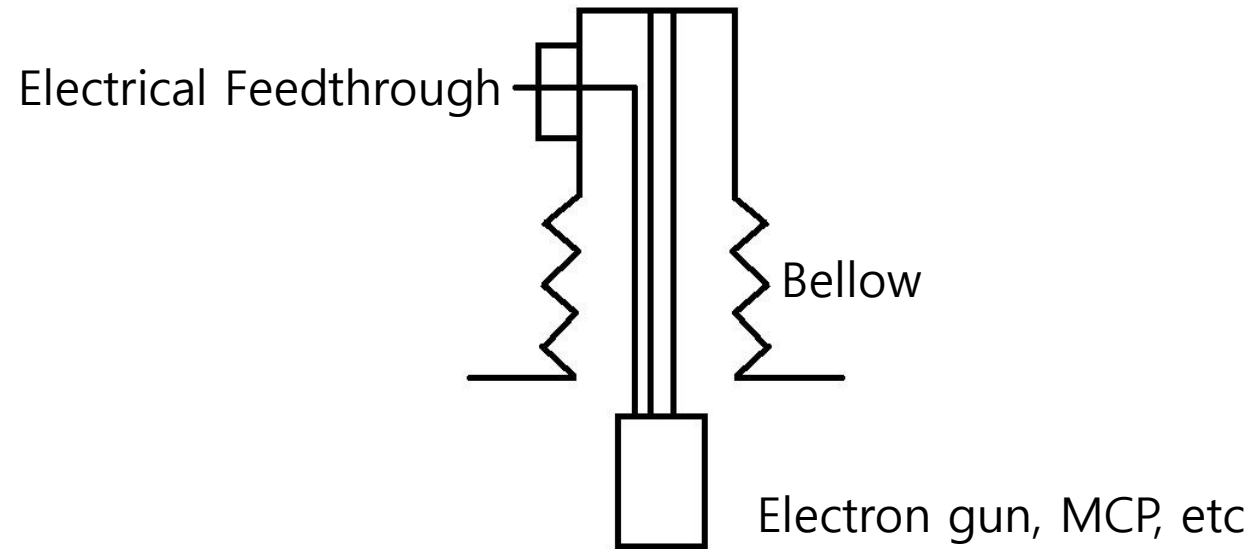


## Components and Price

| 品 名 및 規 格                      | 數 量 | 單 位 | 單 價(₩)    | 金 額(₩)    |
|--------------------------------|-----|-----|-----------|-----------|
| 1. 8"CF Nipple+Ø 101.6×2t 316L |     |     |           | 1,500,000 |
| 2. 8"CF Six Way316             | 2   | ea  | 4,000,000 | 8,000,000 |
| 3. 8"Gate Valve                | 2   | ea  | 2,300,000 | 4,600,000 |
| 4. 6"Gate Valve                |     |     |           | 2,000,000 |
| 5. 8"Blank                     | 2   | ea  | 250,000   | 500,000   |
| 6. 8"View Port                 |     |     | 추후견적      |           |
| 7. Feed trough                 |     |     |           | 2,000,000 |
| 8. 8"CF +2.75CF                |     |     |           | 350,000   |
| 9. 6"CF Cross                  |     |     |           | 1,800,000 |
| 10.다이+Controller               |     |     |           | 2,500,000 |
| 11.배기라인                        |     |     |           | 1,000,000 |
| 12.316 Bolt,Nut                |     |     | 추후견적      |           |

# To do list

- Electron gun, MCP, mirror, Thermal actuator – manipulating, putting in and out problem.



- Control System – LabView.