

# Operating principle of High-Pressure Flow Controller which allows catalyst screening at varied pressures

**[Background]** In catalyst screening experiments, varying reaction conditions such as temperature and pressure are essential to investigate the conversion efficiency and reaction selectivity of a catalyst. When a μ-Reactor (Rx-3050TR) is used for catalyst screening, the reaction temperature can be varied using any one of several temperature control modes. However, changes in reaction pressure affect the GC column head pressure, which results in the deteriorated chromatographic separation. This inconvenient feature can be eliminated by using a High-Pressure Flow Controller (HP-3050FC). With this controller, reactor pressure can be tuned up to 3.5 MPa and its operating principle is described below.

**[Operating principle]** A schematic of a high pressure μ-reactor system is shown in Fig.1. HP-3050FC consists of two mass flow controllers (MF-1 and MF-2), two back pressure controllers (BP-1 and BP-2), Restrictor, Open split interface and High-Pressure Safety Controller. BP-1 controls the reaction pressure and BP-2 controls the column head pressure. Each pressure is controlled independently; therefore, even if the reaction pressure is high, the column head pressure stays constant. For safety operation, the safety controller activates the automatic shutdown of gas supply upon detection of an abnormal pressure.

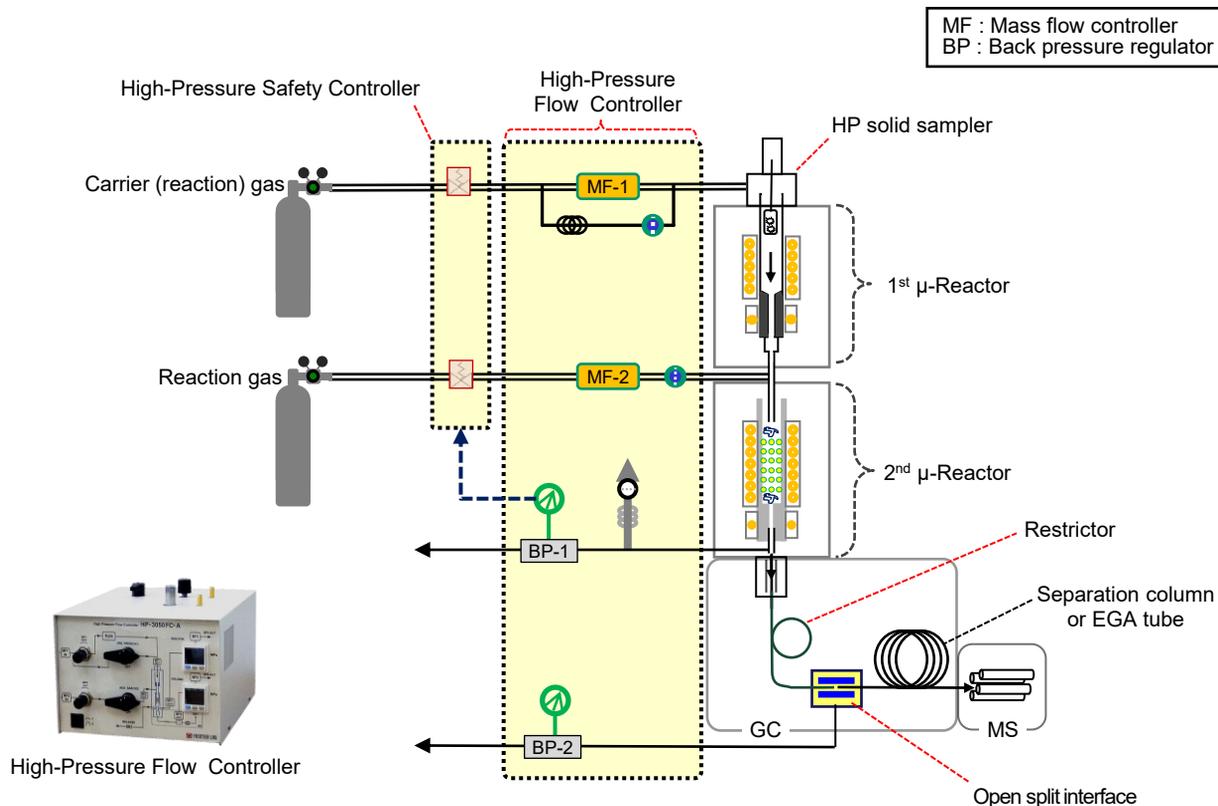


Fig. 1 Schematic of High Pressure μ-Reactor system

High Pressure Flow Controller brochure : [https://www.frontier-lab.com/assets/file/catalogue/HP-3050FC\\_E.pdf](https://www.frontier-lab.com/assets/file/catalogue/HP-3050FC_E.pdf)

**Keywords :** Catalyst, screening, evaluation

**Products used :** Tandem μ-Reactor, Single μ-Reactor, High Pressure Flow Controller

**Applications :** Catalyst screening and evaluation

**Related technical notes :** [RXT-001E](#)

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