LTI – Low Temperature Injector

- **Molecular beam with stable and uniform intensity**
- **Pneumatic run/vent valves – Easy mounting via VCR connections**
- **Dedicated model for low temperatures - MO gases, CBr4,…**
- **Field proven design**
- **Rugged, reliable for long lifetime**

Product introduction

Functions of gas injectors used in gas-source MBE and CBE systems are : (1) the introduction of a gas source into the epitaxy chamber, (2) the generation at the substrate of a molecular beam with stable and uniform intensity, (3) the pre-mixing of different gas sources of the same family within a single injector in order to achieve a high degree of material composition uniformity, and (4) the precracking of species, if required.

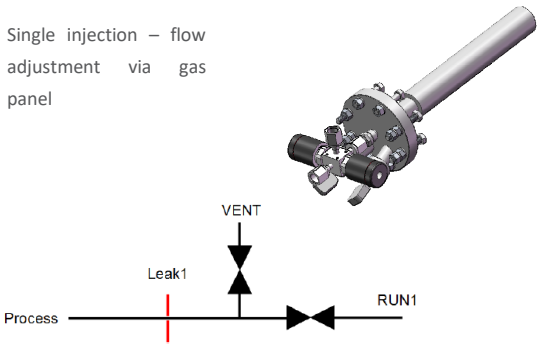
Depending on the nature of the precursor and its thermal stability relative to the growth temperature, the gas injector operates either at a low temperature (< 100°C, Riber's LTI series) for preventing both condensation and dissociation of compounds before on-substrate cracking, or at a high temperature (> 600°C, Riber's HTI series) to thermally decompose the molecular species before impinging on the substrate.

Riber gas injectors are fitted to the evaporation flange through a standard UHV flange, enabling installation on most gas-source MBE and CBE systems. Gas injectors feature independent 1/4 inch VCR® male gas inlets handling up to 2 distinct process gases, for LTI 163 series.

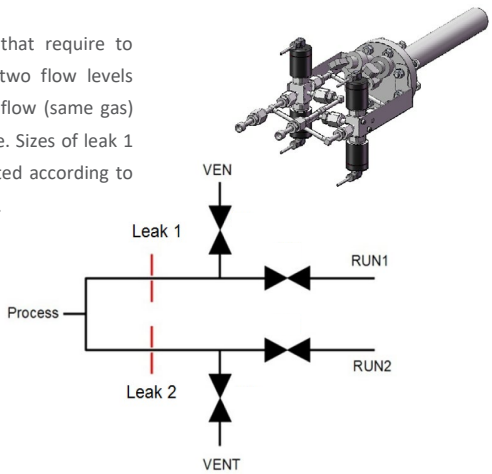
Gas injection lines are equipped with high temperature normally closed pneumatic actuators (200°C max.). Calibrated leak are installed at the run valve level in order to define the accessible flow range, fine adjustment is done via servo-valve, controlled via Baratron pressure transducer. The vent outlet is connected to a vent pump located in the CBr4 gas module (see dedicated page).

The source switching is based on a run/vent operation using a set of two-way valves for each gas line serving the injector. These valves are mounting via VCR connections at the back of the UHV flange. The "run" (to the substrate) and "vent" (to the vent pump) switching valves are located as close as possible to the epitaxy chamber to ensure rapid switching of sources with low transient times (< 1 sec) to produce abrupt layer interfaces.

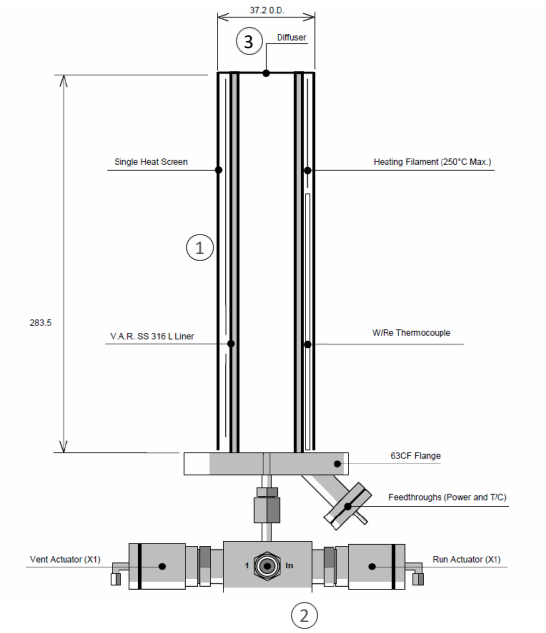
Single injection – flow adjustment via gas panel



For applications that require to switch between two flow levels quickly, the dual flow (same gas) option is available. Sizes of leak 1 & 2 can be adapted according to the needed flows.



Layout



1 – LTI163 injector

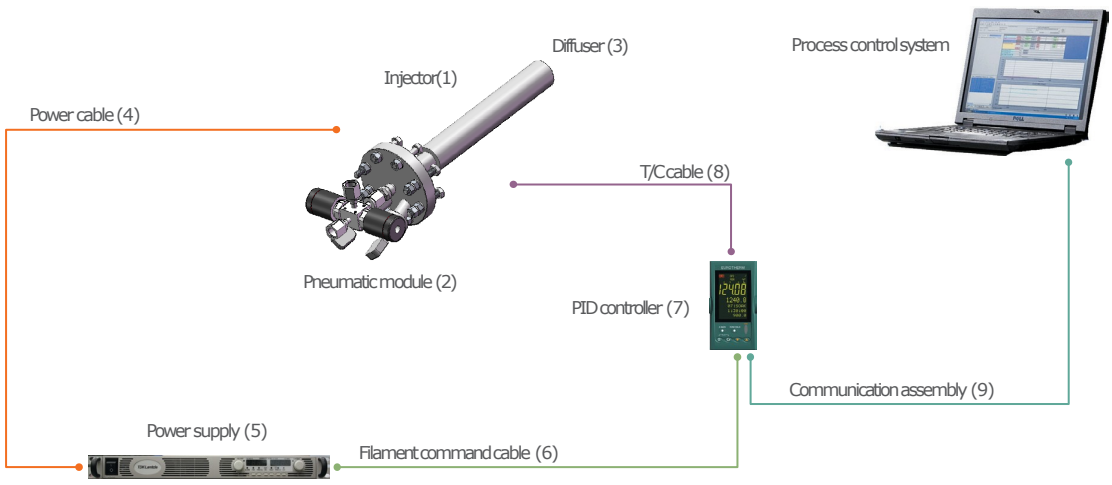
2 – Pneumatic module

3 – Diffuser

Specifications

	LTI 163
Maximum gas inlet	1
Number of Run actuators	1 or 2 – depends on pneumatic module
Number of Vent actuators	1 or 2 – depends on pneumatic module
Gas inlet	¼ inch VCR®
Typical operating temperature	< 100°C
Maximum operating temperature	250°C
Heater	Single tantalum filament
Thermocouple	C type
Outgassing temperature	200°C
Mounting flange	CF63
Power supply	One power supply One temperature controller

Component interfacing



CELLS & COMPONENTS – Low Temperature Injector

RIBER SALES AND SERVICE NETWORK

For more information, please contact your local sales representative

FRANCE
RIBER
31, Rue Casimir Périer
95 873 Bezons Cedex
France
Tel : +33(0)1 3996 65 91
Fax : +33(0)1 3947 4562
Email : customerservice@riber.fr

USA/CANADA
RIBER Inc
216, Route 206, Suite 17
Hillsborough
NJ 08844 USA
Tel : +1 732 603 0680
Fax : +1 732 603 8611
Email : customerservice@riber-us.com

CHINA
RIBER China
Room 1-8, Building A, Dart Tech Park
#516 Wenchuan Road, Baoshan District
Shanghai PR China
Tel : +86 (21) 635 66 266
Fax : +86 (21) 635 66 266
Email : customerservice@riber.cn

OTHER COUNTRIES
RIBER
31, Rue Casimir Périer
95 873 Bezons Cedex
France
Tel : +33(0)1 3996 65 91
Fax : +33(0)1 3947 4562
Email : customerservice@riber.fr

Email: info@riber.com

Website: www.riber.com

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