LIQUID INJECTION SYSTEM (LIS)

Automated Feeding in Shake Flasks

Shake Flask Challenges

Lack of Control

- Lacks bioreactor control options for e.g., pH control or fed-batch
- Leads to inconsistencies in scale-up between shake flasks and bioreactors

Disadvantageous Manual Feeding

- Requires hours of manual, hands-on time
- Causes process interruption, risk of contamination, and loss of culture volume
- Limits complex feeding strategies

What Our Customers Say

"Overall, the LIS system is easy to assemble, reduced manual work significantly, and allowed us to test multiple feeding profiles, including linear and exponential feeding."

- Prof. Dr.-Ing. Frank Eiden (Westphalian University of Applied Sciences)

Key Features

- Automated feeding of liquids into shake flask cultures
- Flexible feeding rates
- Control and monitor your feeding experiments wirelessly with the DOTS Software

Benefits

- Introduce bioreactor-like feeding and control options to your shake flask experiments
- Avoid process interruptions, like stopping the shaker or moving the flask
- Align feeding and control strategies of your shake flask screening experiments with later bioreactor runs
- Unlock a new experimental world in shake flasks
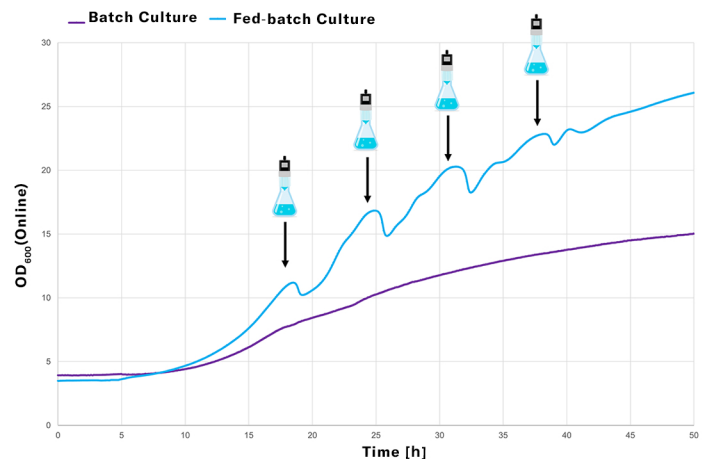
Fed-batch conditions support the growth of *S. cerevisiae* on potato waste

How It Works

The LIS Drive connects to a sterile cartridge, a reservoir for up to 25 mL of liquid. The coupled Drive and cartridge attach to the shake flask and the Drive pumps air through a sterile filter into the cartridge, causing liquid to be dispensed into the flask. LIS enables automated feeding in various profiles, e.g., single shot, multi shot, constant, or exponential. With the DOTS Software, it is now even possible to connect LIS and the CGQ to enable biomass-based feeding in shake flasks.
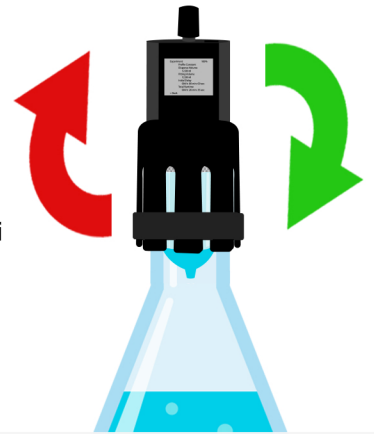
Compatible With Your...

Bioprocess

✔ **For a broad variety of liquids**
  - Sugars (e.g., 40% glucose)
  - Alcohols (e.g., 50% methanol)
  - Glycerol (e.g., 50%)
  - Acids, bases, and inductors (e.g., IPTG)
  - Antifoam and more

Lab Infrastructure

✔ **Works for all 38 mm straight neck shake flasks**

✔ **For different shake flask sizes**
  - From 100 mL - 5000 mL

✔ **For all incubation shakers**
  - Clamps and Sticky Mats

Applications

✔ **Feeding (e.g., fed-batch)**

✔ **Biomass-based feeding**

✔ **Gene induction**

✔ **pH regulation**

✔ **Inoculation**

Components

LIS Drive
Programmable, wireless, miniature pump that controls feeding of liquid into the flask.

LIS Cartridge
Sterile, single-use consumable, shaped for a shake flask lid. Contains a 25 mL reservoir for desired feeding liquid.

DOTS Software
Powerful software for easy actuator handling and real-time data visualization.

Want To Connect The DOTS In Your Bioprocessing?

Contact Us