

Multistage Flash Separator

Controlled separation, phase sampling and quantitative gas measurement

General features

The Coretest Multistage Flash Separator is designed for laboratory characterization of live oils, condensates and pressurized hydrocarbon mixtures. The system separates a measured sample at selected pressure and temperature, measures the recovered gas and liquid, and provides separate sampling connections for gas chromatography (GC).

A jacketed visual cell is combined with a low-pressure liquid receiver, cooled condensate collection and a piston gasometer. The configuration uses one gasometer sequentially: first for gas released from the primary separation, then for additional gas released when the retained liquid is transferred to the low-pressure receiver. Liquid volume is read manually against a calibrated scale.

Proposed specifications

Parameter	Configuration
First-stage cell volume	Approximately 100 mL nominal chamber volume
First-stage pressure capability	Up to approximately 100 bar(g); final pressure-temperature rating defined for the application
Temperature control	Circulating heating/cooling jacket; operating range selected for the sample
Liquid volume measurement	Visual reading against a calibrated scale
Low-pressure stage	Near atmospheric pressure, approximately 1 bar absolute; actual pressure measured
Gas volume measurement	One piston gasometer with pressure and temperature measurement, used sequentially
Condensate recovery	Separate cooled collection for first-stage and second-stage gas
Phase sampling	Gas sampling upstream of downstream cooling; pressurized liquid sampling
Application-specific parameters	Gasometer capacity, temperature range, wetted materials, seals and measurement uncertainty

Nominal cell volume is not the allowable sample charge. Working fill and gasometer capacity are selected from the sample quantity, phase behavior and expected gas yield.

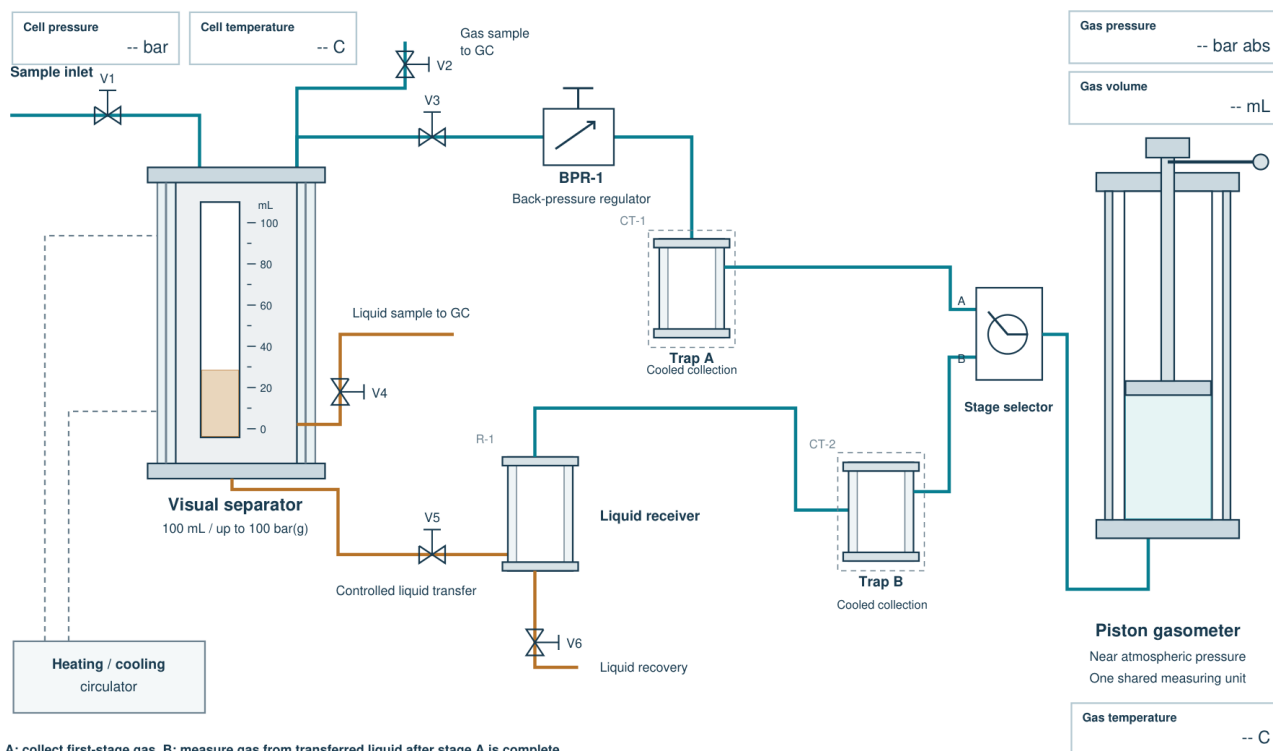
Instrument mimic

The technical mimic shows the visual cell, pressure-control circuit, separate low-pressure receiver and cooled collection paths, and one shared gasometer. The two gas paths are measured sequentially. Dashed lines at the cell identify the separate thermal circuit.

Coretest

MULTISTAGE FLASH SEPARATOR

Instrument mimic | manual liquid-volume reading | sequential gas measurement



Visual separator. Manual reading of liquid volume against a calibrated scale; no camera.

Pressure control. Controlled sample admission, first-stage back-pressure regulation and phase-sampling connections.

Low-pressure receiver. Collection of liquid transferred from the first stage and separation of additional flash gas.

Condensate traps. Separate recovery of condensate associated with each gas collection step.

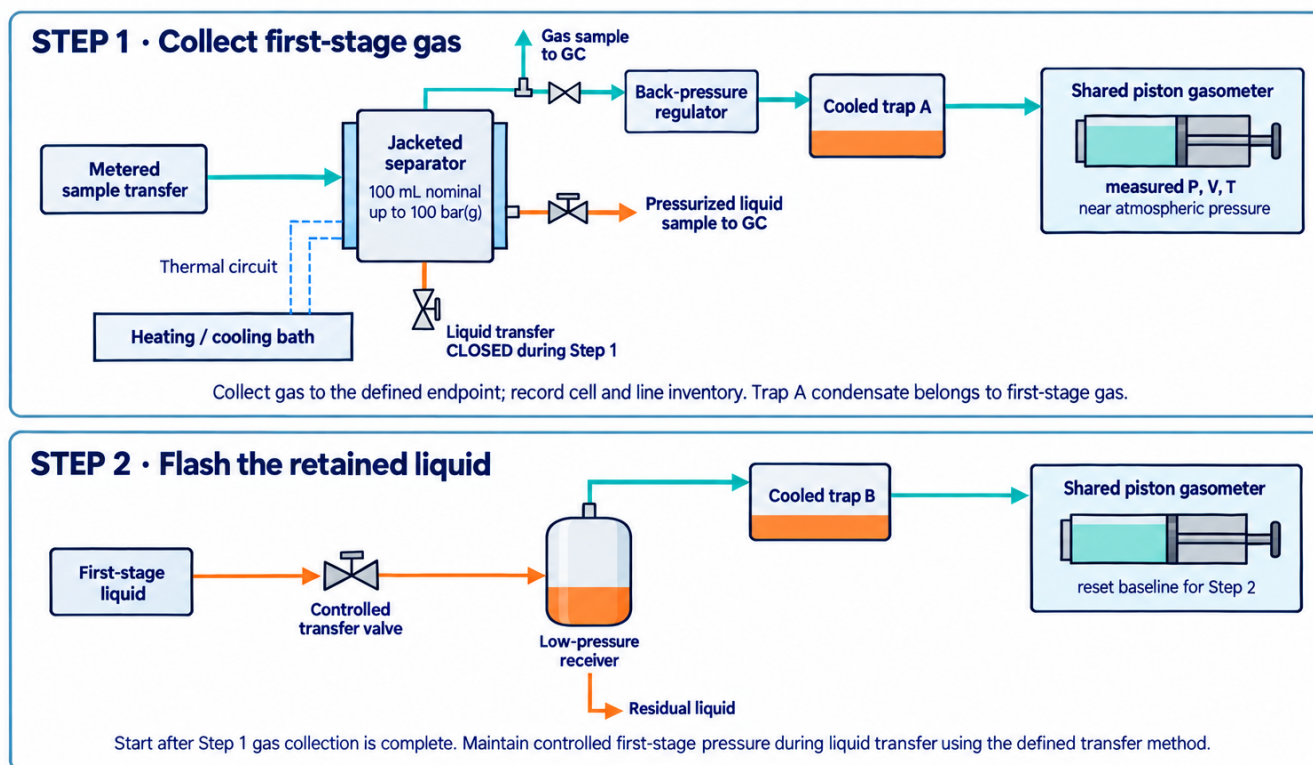
Piston gasometer. Sequential measurement of gas from the two stages, with recorded pressure and temperature.

Conceptual instrument mimic. Valve identifiers are illustrative. The selector requires sequential operation; isolation, transfer-pressure control and protective provisions must be defined in the engineered P&ID; before establishing an operating procedure.

System configuration

The proposed package combines the visual separator cell and manual volume scale; controlled sample-transfer interface; back-pressure regulator; heating/cooling circuit; low-pressure liquid receiver; condensate traps; one piston gasometer; and the valves, tubing and phase-sampling connections required for sequential measurement. The transfer drive and GC interface are selected to suit the laboratory. GC analysis is performed on the laboratory's external analyzer.

Coretest Multistage Flash Separator Sequential operation with one shared piston gasometer



Conceptual measurement sequence, not a valve-operating diagram. GC samples, condensates and retained inventory are included in the balance.

Conceptual sequence: the same gasometer is shown in both steps. Final valve routing, pressure-maintained transfer and protective provisions are defined during engineering.

Measurement sequence

- 1. Primary separation.** Introduce a known, representative sample quantity at controlled conditions. Record the liquid volume and measure the first-stage gas after condensate collection. Take representative gas and pressurized-liquid samples for GC, accounting for all withdrawals.
 - 2. Low-pressure flash.** After first-stage gas collection is complete, prepare the gasometer and record a new baseline. Transfer the retained liquid under controlled conditions to the low-pressure receiver. Measure the additional gas, residual liquid and separately collected condensate.
 - 3. Results and balance.** Combine gas P-V-T measurements, recovered liquid/condensate quantities and GC results. Account for cell and line inventory and analytical samples. Results can include stage gas yields, liquid recovery, GOR and overall composition, subject to the agreed method and available analytical data.
- Reference conditions.** Phase fractions refer to the selected separation conditions. Determining fractions at the original sampling conditions requires a representative sample and a procedure that preserves or reproduces those conditions, or a validated thermodynamic reconstruction. Material-balance closure is checked against an independently established input quantity.