

MERCURY INSTRUMENTS

Analytical Technologies



NG-Sampling System-3000 for Natural Gas



The NG-Sampling System-3000 is designed to take a sample stream from a pressurized natural gas source. It can either be connected directly to a pipeline or a sampling cylinder containing compressed natural gas.

The outlet of the sampling system can be connected directly to an analyzer (UT-3000) or the gas can be fed into a special sample bag (Tedlar® bag) and carried to the analyzer.

Tedlar® bags are available as accessories for the UT-3000 Mercury Ultratracer.



Member of the **envea** group

General Information

For measuring mercury in natural gas the pressure of a high pressure sample feed has to be reduced to a suitably low pressure before measurement.

The new **NG-SAMPLING SYSTEM-3000** follows a straight forward design. It integrates a minimum of components. All gas wetted parts in the sample path have been silica coated. This allows a very fast conditioning and low memory effects.

Setup and Operating principle

The high pressure sample passes a ball valve **(1)**. A coated filter **(2)** removes particles from the sample.

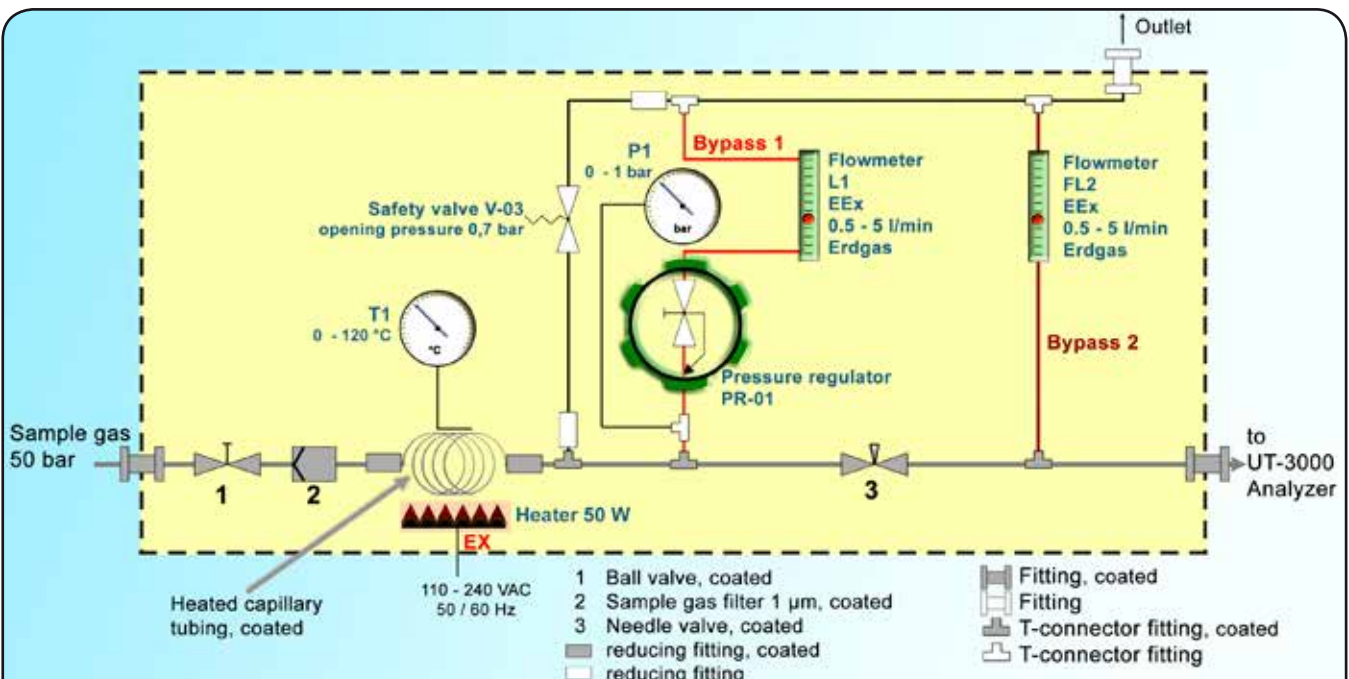
After that the sample gas passes a heated capillary tubing. Heating compensates the Joule-Thomson Effect caused by pressure drop inside of the capillary. The heater temperature is displayed on the thermometer **T1**.

Pressure regulator **PR-01** keeps the pressure at outlet of the capillary constant. The pressure is shown on pressure gauge **P1** and can be adjusted on **PR-01**. Excess gas is vented off through flow meter **FL1**.

With needle valve **3** the combined flow of sample gas to the analyzer and to the vent through flow meter **FL2** can be adjusted. If the analyzer samples gas from this stream the flow through **FL2** will decrease, but has always to be positive.

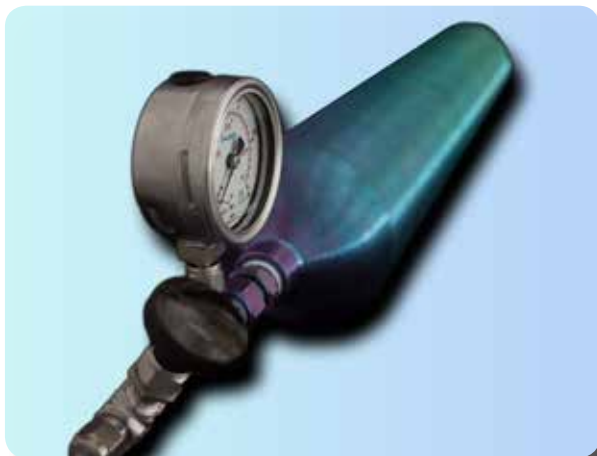
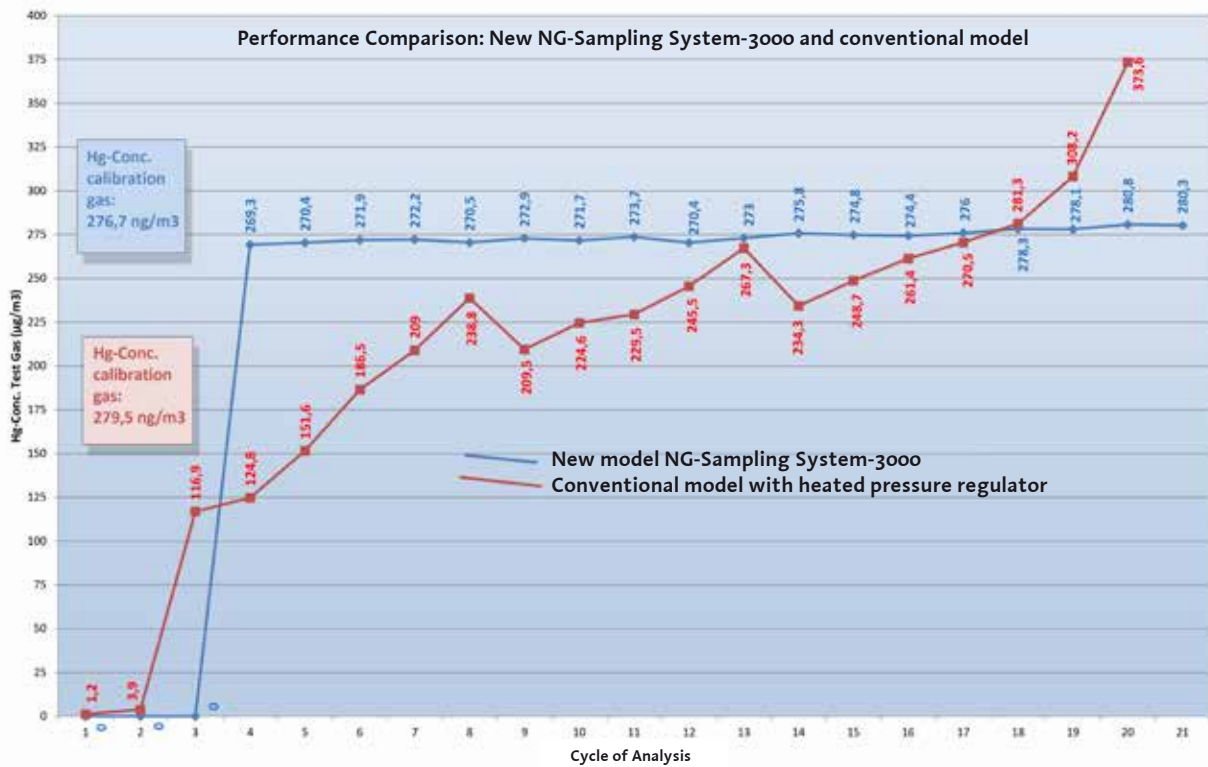
In case of pressure breakthrough and a following increase of pressure at the low pressure side the safety valve **V-03** will open and automatically release the pressure.

With ball valve **1** at Sample IN the sampling system can be isolated from the gas source. The needle valve **3** allows to close the outlet sample flow.



The new **NG-SAMPLING SYSTEM-3000** shows a considerable performance improvement compared to conventional models with integrated heated pressure regulator.

1. The **NG-SAMPLING SYSTEM-3000** signal rises from start of measurement within a single measuring cycle (= 3 min) to more than 90% of the final concentration, whereas the conventional models need 10 cycles more.
2. The readings using the new **NG-SAMPLING SYSTEM-3000** are clearly more stable than the readings of conventional models.
3. The readings using the new **NG-SAMPLING SYSTEM-3000** are constant over a wide pressure range of the feed gas and pressure settings are kept much more stable.
4. In contrast to conventional models, the readings obtained with the new **NG Sampling System 3000** are insensitive to parameters not set precisely.
5. The improved design of the **NG-SAMPLING SYSTEM-3000** allows easier maintenance in case of contamination with liquid hydrocarbons.



Comparison of the results of the newly designed NG-Sampling System-3000 versus a conventional model with heated pressure regulator.

Pressure ranges between 90 bar (at start) and 20 bar (at end).

Coated sample gas zylinder for high pressure methane calibration gas



Technical Specifications

Particle filter	1 micron stainless steel T-filter
Maximum Sample inlet pressure	approx. 200 bar
Pressure P1 (secondary side of heated pressure regulator)	0.0 – 1.0 bar (0.28 bar / 4 psi typically)
Flow 1	0 - 5 l/min
Flow 2	0 - 5 l/min
Materials used	Stainless Steel (partially coated), Viton, Ismaprene
Power supply	230 VAC / 50 Hz
Power consumption	175 VA
Dimensions	45 x 23 x 36 cm (W x H x D)
Weight	approx. 10 kg

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