

# 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.



## 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.

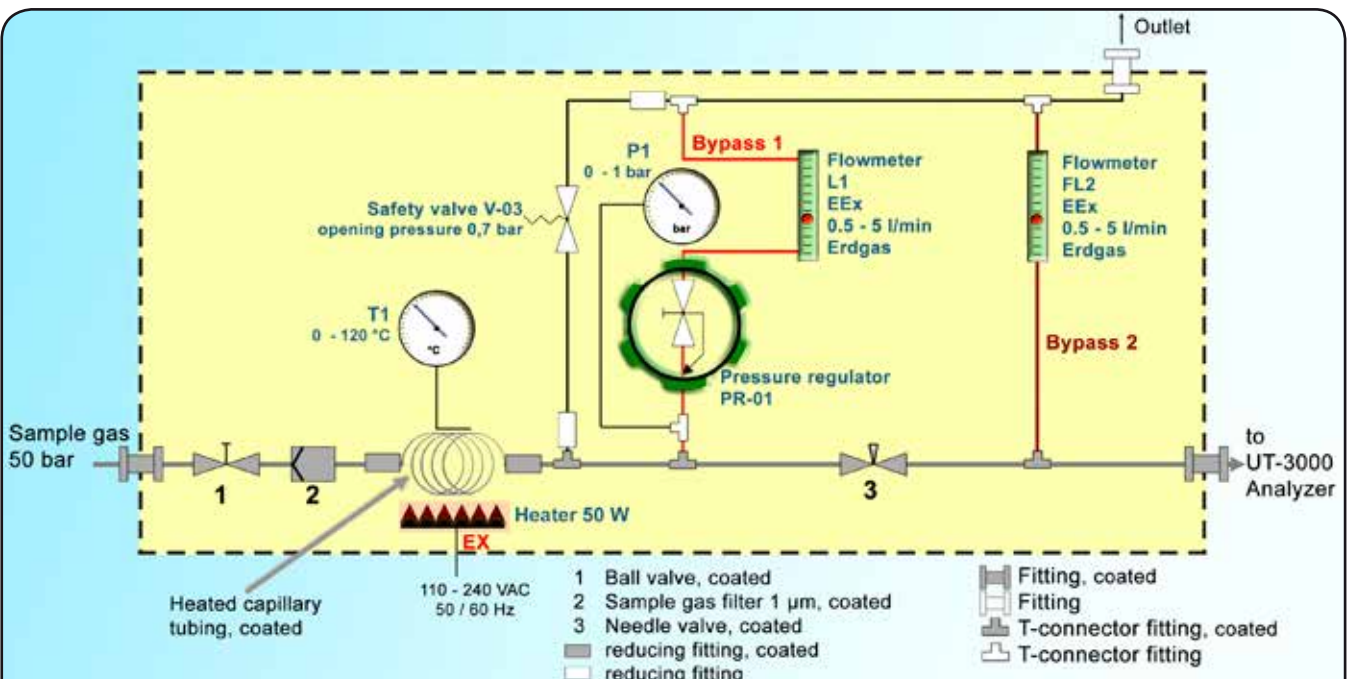
After that the sample gas passes a heated capillary tubing. Heating compensates the Joule-Thomson Effect caused by pressure drop inside of the capillary. The heater temperature is displayed on the thermometer **T1**.

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.

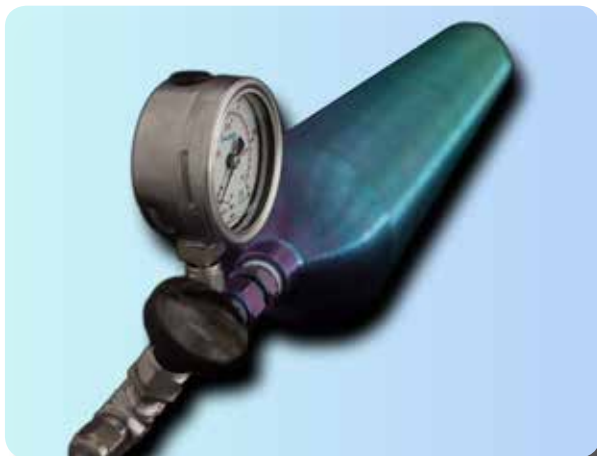
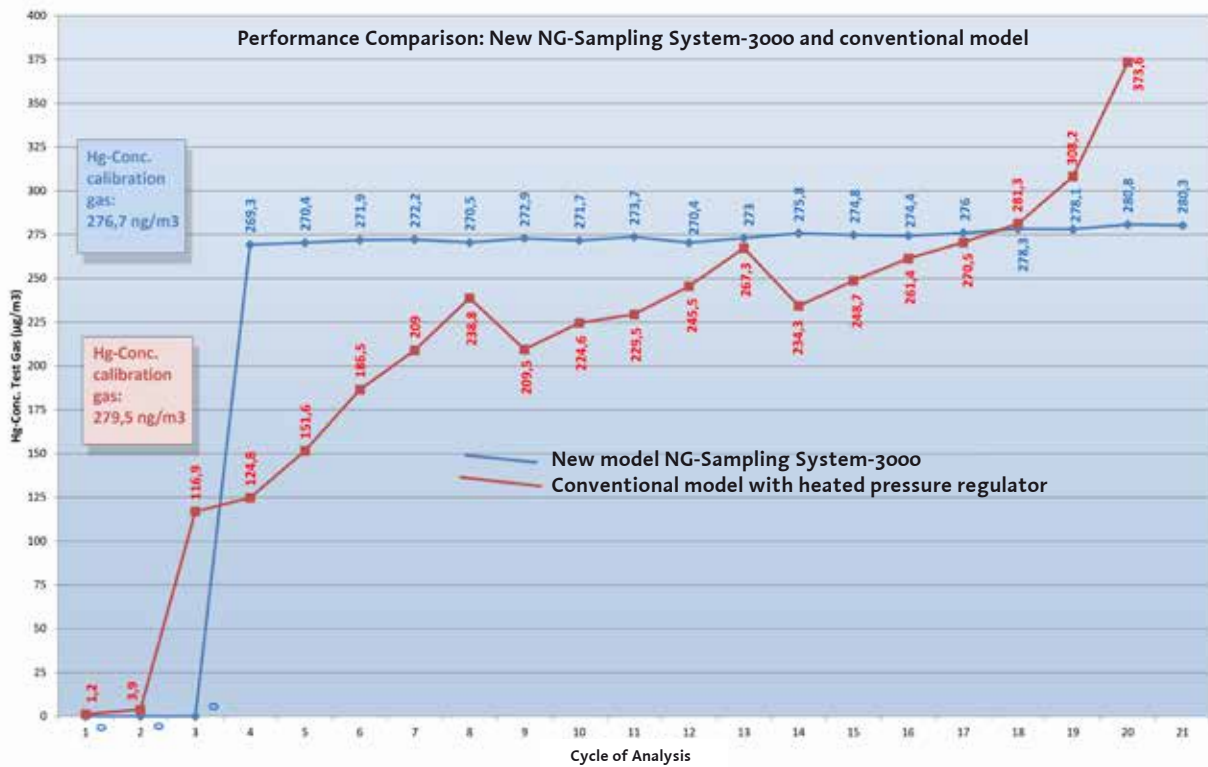
In case of pressure breakthrough and a following increase of pressure at the low pressure side the safety valve **V-03** will open and automatically release the pressure.

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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