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BÜHLER TECHNOLOGIES

SAMPLE GAS PUMPS

COMPONENTS FOR SAMPLE GAS CONDITIONING

SAMPLE GAS PUMPS ARE THE HEART OF EXTRACTIVE GAS ANALYSIS SYSTEMS. THEY SAFELY CONVEY THE SAMPLE GAS FROM THE SAMPLING POINT TO THE ANALYSER WHENEVER THERE IS INSUFFICIENT OVERPRESSURE AT THE SAMPLING LOCATION.

Through the design and choice of materials used in the sample gas pump, it must be ensured that the composition of the sample gas remains unaffected. Although particulate contamination is generally removed at the sampling point by suitable gas sampling probes, the sample gas may still be corrosive and humid by the time it reaches the conditioning system.

To avoid the risk of false air ingress entering the sample gas line and the conditioning system, we recommend installing the sample gas pump upstream of the system, if necessary already at the sampling point. The product range offers pumps of various sizes and flow rates, ensuring that a suitably dimensioned pump with the correct level of protection is available for every application.

1. SAFE AREA

1.1 Sample Gas Pumps with nominal flow rate of 280 l/h

SAMPLE GAS PUMP P1.1E WITH BYPASS

SAMPLE GAS PUMP P1.2

P1.1

P1.2

All Sample Gas Pumps from Bühler Technologies are based on a one-piece PTFE bellows. All other components in contact with the medium are made of highly corrosion resistant plastics or stainless steel in the connection area. The design principle also allows the pump to convey any condensate that may occur. Sample Gas Pumps from Bühler Technologies are in use worldwide in their thousands and are characterised by a long service life.

1.2 Sample Gas Pumps nominal flow rate of 400 l/h and 800 l/h

SAMPLE GAS PUMP P2.3

SAMPLE GAS PUMP P2.84

400 l/h

800 l/h

1.3 Sample Gas Pumps with 2 gas paths (2x 400 l/h; 2x 800 l/h)

SAMPLE GAS PUMP P4.3

SAMPLE GAS PUMP P4.83

400 l/h

800 l/h

2. EX-HAZARDOUS AREA

Depending on the hazard level and the region, these application areas are classified into zones or divisions. For this purpose, the standard components of the pump head are combined with the appropriate drive components. This ensures that the advantages of our design principle are fully retained even in these demanding applications.

The Sample Gas Pumps carry the mandatory labeling and the corresponding certificate or approval if required. They may also be subject to specific inspections and/or maintenance intervals.

CATEGORY EX ZONE 1

Sample Gas Pumps with ATEX-Approved Motors (direct or via intermediate flange)

2.1 Sample Gas Pumps with nominal flow rate of 400 l/h and 700 l/h

SAMPLE GAS PUMP P2.2 ATEX

SAMPLE GAS PUMP P2.74 ATEX

400 l/h

700 l/h

CATEGORY EX-ZONE 2 AND CLASS I DIVISION 2

Sample Gas Pumps with Correspondingly Approved Motors (direct or via intermediate flange)

2.2 Sample Gas Pumps with nominal flow rate of 280 l/h

SAMPLE GAS PUMP P1.3

280 l/h

2.3 Sample Gas Pumps with nominal flow rate 400 l/h and 800 l/h

SAMPLE GAS PUMP P2.2 AMEX

SAMPLE GAS PUMP P2.84 AMEX

400 l/h

800 l/h

SAMPLE GAS PUMPS FOR CONVEYING FLAMMABLE GASES IN ZONE 2

The Sample Gas Pumps may only be used for conveying flammable and/or humid sample gases.
For conveying sample gas containing condensate, the pump head must be rotated 180° downward.
The pumps are not suitable for outdoor use in ATEX/IECEx hazardous areas.

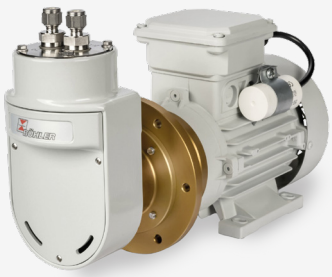
2.4 Sample Gas Pumps with nominal flow rate of 280 l/h

SAMPLE GAS PUMP P1.2

280 l/h

2.5 Sample Gas Pumps with nominal flow rate of 400 l/h

SAMPLE GAS PUMP P2.3C



SAMPLE GAS PUMP P2.4C

400 l/h

3. ELECTROLYSIS

In this application field, a distinction is made between H_2 and O_2, as the pumps must be handled differently. During the production of hydrogen through electrolysis, H_2O is split into its components H_2 and O_2. Both components place special demands on the quality and execution of the Sample Gas Pumps applied. Although the pumps are fundamentally composed of the standard components from our pump range, they undergo separate manufacturing and quality assurance steps, including the corresponding certifications, to meet these specific requirements.

H_2 PUMPS OPTIMISED FOR HIGH-PURITY HYDROGEN

3.1 Sample Gas Pumps with nominal flow rate of 400 l/h and 700 l/h

SAMPLE GAS PUMP P2.2 ATEX-H2

400 l/h

SAMPLE GAS PUMP P2.74 ATEX-H2

700 l/h

SAMPLE GAS PUMP P2.4 AMEX-H2

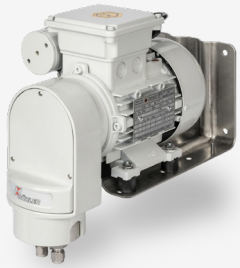
400 l/h

O_2 PUMPS OPTIMIZED FOR HIGH-PURITY OXYGEN

3.2 Sample Gas Pumps with nominal flow rate of 400 l/h and 700 l/h

SAMPLE GAS PUMP P2.2 ATEX-O2

400 l/h



SAMPLE GAS PUMP P2.74 ATEX-O2

700 l/h

SAMPLE GAS PUMP P2.2 AMEX-O2

400 l/h

4. USEFUL INFORMATION

WHY BELLOWS?

With experience in building extractive gas analysis systems, the Sample Gas Pumps were developed specifically for their applications. This means that both their design and choice of materials are tailored exclusively to the particular requirements of this field. The accuracy and reproducibility of analytical results depend on the sample gas remaining completely unchanged from the sampling point to the analyser's measuring cell. No material may be added to or absorbed from the gas along the gas path.
The sample gas—often highly corrosive and sometimes fluctuating in composition—requires high-quality materials in all components of a pump that come into contact with the medium. In addition, a sufficiently high flow rate must be ensured, even with long sample gas lines, and ideally without pressure fluctuations. Any condensate that may form before the final drying stage must not negatively impact either the function or the service life of the pump.
All these requirements led to the use of a bellows as the core element of Bühler Sample Gas Pumps. This component, made entirely of PTFE, fulfils all the above criteria exceptionally well.

THE PUMP HEAD

Depending on the configuration of the sample gas line—whether flexible tubing or rigid piping—the pump head is available in PTFE or stainless steel. The inlet and outlet valves are screwed in as complete cartridges, making them easily accessible and quick to replace. To adjust a defined sample gas flow, pump heads with an integrated bypass valve are available. All valves are manufactured from corrosion-resistant materials.

TWO SEPARATE GAS PATHS

In larger gas analysis systems, several sample gas streams are often conditioned separately. For such applications, Sample Gas Pumps with two pumps driven in parallel by a single motor offer both economic and space-saving advantages. The two pumps can be equipped differently depending on the application, allowing each to be tailored to its respective sampling line.
If a flow rate of more than 800 l/h is required, the two pumps can be connected in parallel, providing a combined flow rate of up to 1400 l/h.

MOUNTING OPTIONS

Sample Gas Pumps with a flow rate of up to 280 l/h feature an integrated mounting bracket designed for horizontal installation. For plate mounting, a mounting console with vibration dampers is available as an accessory. For the larger models, a mounting console with vibration dampers is included in the standard scope of delivery.
For applications requiring special protection or temperature conditions, variants with an intermediate flange are available. This intermediate flange is positioned between the motor and the pump and provides a degree of mounting flexibility. Depending on the application, the motor can be installed inside or outside the analyser housing, with the pump correspondingly placed outside or inside (e.g. if the pump requires heating). The wall thickness of the analyser housing can be bridged by up to 30 mm.

SAMPLE GAS PUMPS

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