

# 1 Introduction

## 1.1 Intended use

Model P1.3 sample gas pumps are intended for installation in gas analysis systems for industrial applications.

The complete designations of the sample gas pump P1.3 are:

|                       |                                         |                                                              |
|-----------------------|-----------------------------------------|--------------------------------------------------------------|
| <b>P1.3 ATEX</b>      | FM16ATEX0018X                           | II 3G Ex nA nC IIC T4...T3 Gc                                |
|                       | ---                                     | II 3/3G c IIC T3/T4 X (Examined by Bühler Technologies GmbH) |
| <b>P1.3 IECEx</b>     | IECEx FMG 16.0012X                      | Ex nA nC IIC T4...T3 Gc                                      |
| <b>P1.3 US/Canada</b> | Cl. I, Div. 2, Gps. A, B, C, D, T4...T3 |                                                              |

The maximum surface temperature varies by the medium and ambient temperatures. Please refer to chapter "[Technical data](#) [> page 29]" for the correlation between medium temperature, ambient temperature and the pump's temperature class. Flammable mediums must not be heated beyond these values. Please note, flammable gas must only be heated up to 80 % of its ignition temperature. The lower of the two values is the maximum medium temperature.

Gas sampling is generally **prohibited** if the gas flow results in a dangerous electrostatic charge in the bellow/pump body (also see chapter "[Operation and control](#) [> page 16]").

A minimum of 20 cm of tubing or piping must be installed between the sample gas pump and other system elements installed in the gas outlet according to the flow chart (e.g. cooler, analyser, filter, flow regulator, etc.) to ensure compliance with the temperature classes.

The P1.3 sample gas pump is not suitable for liquids. It may be operated at an ambient temperature range from 0 °C to 50 °C. Outdoor installation and operation prohibited.

Please note the specifications in the data sheet on the specific intended use, existing material combinations, as well as pressure and temperature limits.

## 1.2 Applied standards

**FM US:** FM 3600:2011, FM 3611:2004, FM 3810:2005

**FM Canada:** CSA C22.2 No. 213:2012, CSA C22.2 No. 1010.1:2004

**ATEX:** EN 60079-0:2012 + Supplement A11:2013, EN 60079-15:2010

**IECEx:** IEC 60079-0:2011, IEC 60079-15:2010

The following standards have been examined by Bühler Technologies GmbH in line with the "internal control of protection":  
EN 13463-1:2009, EN 13463-5:2011

## 1.3 Special conditions

### 1.3.1 General

To maintain a T4 to T3 temperature class care shall be taken to ensure the ambient temperature does not exceed 50 °C.

Temperature classes are defined by the following table:

| Type of gas   | Maximum medium temperature | Temperature class    |             |
|---------------|----------------------------|----------------------|-------------|
|               |                            | at installation site | in gas path |
| non-flammable | 50 °C                      | T4                   | ---         |
|               | 70 °C                      | T3                   | ---         |
| flammable     | 50 °C                      | T4                   | T3          |

### 1.3.2 Especially FM US/CANADA

The apparatus is to be installed in a tool-secured enclosure in compliance with the enclosure, mounting, spacing and segregation requirements of the ultimate application.

### 1.3.3 Especially IECEx/ATEX

The installer shall provide transient over-voltage protection of the supply connections at a voltage not to exceed 140% of the voltage rating of the pump.

The pump shall be mounted in an enclosure providing a minimum degree of protection of IP54 in accordance with IEC/EN 60079-15, and shall be installed within a tool-secured enclosure which meets the requirements of IEC/EN 60079-0 and IEC/EN 60079-15.

### 1.4 Item number structure

The device is delivered with different configurations. The part number given on the type plate informs you about the specific configuration of your device.

On the type plate you will find the order number as well as the 13-digit product key. This number is a code where each digit (x) describes a certain feature:

| 42 | xx | x | x | x | 1 | x | x | x | 00 | Product feature                                      |
|----|----|---|---|---|---|---|---|---|----|------------------------------------------------------|
|    | 30 |   |   |   |   |   |   |   |    | <b>Basic model</b>                                   |
|    |    |   |   |   |   |   |   |   |    | P1.3 ATEX, IECEx, US/Canada                          |
|    |    |   |   |   |   |   |   |   |    | <b>Motor voltage</b>                                 |
|    |    | 1 |   |   |   |   |   |   |    | 230 V 50 Hz 0,48 A                                   |
|    |    | 2 |   |   |   |   |   |   |    | 115 V 60 Hz 0,84 A                                   |
|    |    | 3 |   |   |   |   |   |   |    | 12 V DC 1,55 A (on request)                          |
|    |    | 4 |   |   |   |   |   |   |    | 24 V DC 0,8 A                                        |
|    |    |   |   |   |   |   |   |   |    | <b>Pump head position</b>                            |
|    |    | 1 |   |   |   |   |   |   |    | Normal position vertical                             |
|    |    | 2 |   |   |   |   |   |   |    | Turned by 180°                                       |
|    |    |   |   |   |   |   |   |   |    | <b>Pump head material</b>                            |
|    |    | 1 |   |   |   |   |   |   |    | PTFE                                                 |
|    |    | 2 |   |   |   |   |   |   |    | VA (1.4571)                                          |
|    |    | 3 |   |   |   |   |   |   |    | PVDF with bypass valve                               |
|    |    | 4 |   |   |   |   |   |   |    | PVDF                                                 |
|    |    |   |   |   |   |   |   |   |    | <b>Valve material</b>                                |
|    |    | 1 |   |   |   |   |   |   |    | Up to 70 °C; PTFE/PVDF                               |
|    |    |   |   |   |   |   |   |   |    | <b>Screw in connections (depending on pump head)</b> |
|    |    |   | 0 |   |   |   |   |   |    | without                                              |
|    |    |   | 1 |   |   |   |   |   |    | PVDF DN 4/6 *                                        |
|    |    |   | 2 |   |   |   |   |   |    | PVDF 1/4"-1/6" *                                     |
|    |    |   | 3 |   |   |   |   |   |    | PVDF 1/4"-1/8" *                                     |
|    |    |   | 5 |   |   |   |   |   |    | VA (1.4401) 6 mm **                                  |
|    |    |   | 6 |   |   |   |   |   |    | VA (1.4401) 1/4" **                                  |
|    |    |   |   |   |   |   |   |   |    | <b>Mounting accessories</b>                          |
|    |    |   | 0 |   |   |   |   |   |    | without                                              |
|    |    |   | 1 |   |   |   |   |   |    | Mounting bracket and set of vibration dampers        |
|    |    |   | 2 |   |   |   |   |   |    | Set of vibration dampers only                        |
|    |    |   |   |   |   |   |   |   |    | <b>Housing</b>                                       |
|    |    |   | 0 |   |   |   |   |   |    | without                                              |
|    |    |   | 1 |   |   |   |   |   |    | Housing incl. 3 m connection cable                   |

\* PTFE or PVDF pump body only.

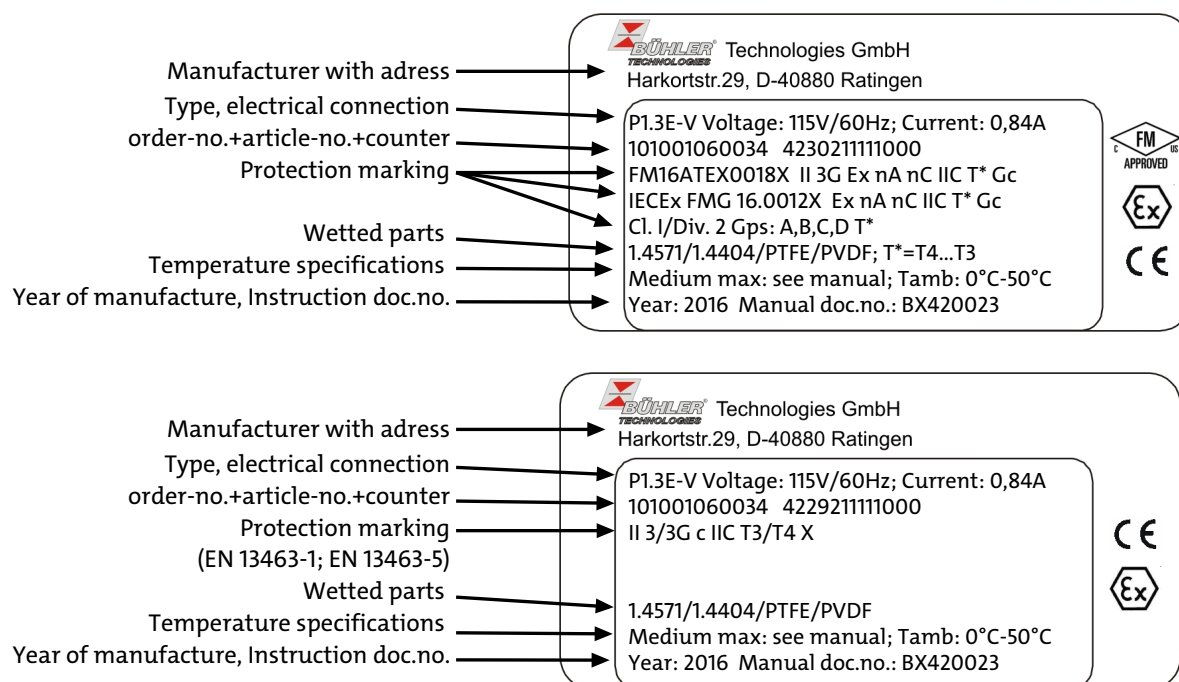
\*\* VA pump body only.

If there are special instructions for a pump type, they are marked in the manual.

Take care of the limits of the pump. When ordering spare parts chose for the type matching part numbers (e.g. valves).

## 1.5 Type plates

### Examples:



## 1.6 Scope of delivery

- 1 x Sample gas pump with motor
- Product documentation
- Connection- and mounting accessories (only optional)

**For logistics reasons, connection- or mounting accessories such as screw-in connections and/or mounting bracket are not factory installed!**

## 1.7 Product description

The sample gas pumps are intended exclusively for the pumping of gaseous media. They are not suitable for liquids.

Please observe the information at the end of these instructions in relation to specific intended use, available material combinations, and pressure and temperature limits. In addition, please observe the information and labelling on the identification plates.

The maximum surface temperature depends on the ambient temperature and the temperature of the medium. The connection between the temperature of the medium, the ambient temperature and the temperature class of the pump is specified in the technical data.

### NOTICE

#### Limitations



The P1.3 pumps can pump non-flammable gaseous media and flammable gaseous media that are probably not explosive in normal operation (sampling from zone 2). Sampling gas from zone 2 is generally forbidden if the gas flow leads to a dangerous electro-static charge in the bellow / pump body (also see the "Operation" section). The ATEX respectively IECEx versions are provided for use in equipment group II, equipment category 3G, explosive category IIC, temperature class T4...T3, pumps must not be operated in dusty area. The US/Canada version is provided for use in Class I, Division 2, Groups A, B, C, D.

For applications in which the sample gas is still damp, condensate can form in the pipelines and in the pump body. In such cases, the pump body must be mounted in a hanging position (see point “Conversion to pump body pointing down”).

**NOTICE**

Never use sample gas pumps outdoors!