PTZ-BOX 3.0 Electronic Volume Converter
Documentation and Technical Specifications

EN ISO
9001
DNV
Certified
Company

vemm tec
Messtechnik GmbH

Advantages

The PTZ-BOX 3.0 is an electronic converter for gas volume meters (for custody transfer) with extended features:
- LF or HF single/dual pulse input or encoder
- Sensors included, pressure sensor internally or externally mounted
- Additional pressure or temperature sensor optionally available
- 4 user configurable Quick Access Buttons for direct access to important values and sub menus
- Tariff counters (max. 4)
- Energy counter
- Password structure with different access levels
- Digital/pulse/analogue outputs (4)
- 10 point flow meter curve correction
- Several compressibility calculation methods, including the full composition AGA 8 calculation
- Configuration and communication software for Windows™ included

Display and buttons

The PTZ-BOX 3.0 is equipped with a display with 128 x 64 pixels and back light. It is operated by the 10 buttons on the front panel. Actual values, stored values, metrological and configuration data as well as status indications can be accessed through the buttons. 4 Of the buttons are user configurable for direct access to important values or sub menus.

Operation

The PTZ-BOX 3.0 is a battery powered or optionally line powered volume converter for gas measurement applications. Applications are with gas flow meters providing LF/HF pulse or encoder signals.

The converter is equipped with energy-saving pressure and temperature sensors. Standard cable length is 2.5 meter; the maximum cable length of an external pressure sensor is 5 meter and for the temperature sensor that is 10 meter.

PTZ-BOX 3.0 calculates the compressibility factor Z of the gas as well as the conversion factor C with the measured absolute pressure and temperature. From these values, it calculates the volume at base conditions and the base flow rate. All calculations are performed according to EN 12405, AGA 7 and ISO 6976.

The compressibility factors Z and Z_b may be fixed or calculated for natural gas according to:
- AGA NX 19 (mod.)
- AGA 8 G1 or G2
- AGA 8-92 DC (full composition)
- SGERG 88

Base conditions for pressure and temperature as well as the gas composition and other parameters are configurable.

Communication

The PTZ-BOX 3.0 can be easily configured and read out by using the included software and a computer. Many parameters can be changed via the keypad as well. Available serial interfaces are IEC1107 infrared (via USB 2.0 connection), wired RS 232 or RS 485.
The PTZ-BOX 3.0 can be connected directly to a computer, connected via a line modem or via a GSM/GPRS modem. Local read out can also be performed by using a notebook.

The device can also be accessed by DCS or SCADA systems via Modbus RTU or other dedicated protocols.

Digital Inputs and Outputs

Four digital inputs are available. They are configurable as low frequency, high frequency or binary inputs. Maximum 2 of these can be used for connecting the gas meter. Encoder input is available (option).

The PTZ-BOX 3.0 has four outputs, configurable either as binary output, as pulse output with adjustable frequency and pulse width or optionally as analogue output (4 – 20 mA). These outputs are programmable as flow related signals, alarm signals or as status indication (open door contact, valve position, etc.). The PTZ-BOX 3.0 can be used for remote indication and for controlling installations or other flow related devices.

Memory

All data is stored in FLASH memory that provides capacity for independent configurable records:
- 25 monthly records
- 400 daily records
- Large custom data archive; records with programmable intervals of 1 second to 1 hour; size depending on remaining memory capacity
- Binary, extremes and setting archive for the traceability of changes
- Billing archive and Tariff counters

Power Supply

The power supply is a lithium battery. The life time of the battery is typically between 6 to 8 years, depending on the use of the device. Low battery level generates an alarm 90 days before the battery change is required. A backup battery is provided to ensure that the main functions of the device will remain intact during replacement of or at depleted main battery.

As an option, the PTZ-BOX 3.0 can be powered by an external intrinsically safe power supply. The battery will then provide power in case of line power failure. The use of high

frequency sensors, high scanning frequency or communication with a high frequency requires line powering.

Documentation and Software

Each PTZ-BOX 3.0 is provided with the following documentation:
- CD-ROM with
  - IOM-Installation, Operation and Maintenance Manual (as PDF-softcopy)
  - Software for configuration and read out by computer
- Specification data sheet with the pre-set parameters of the measuring system and calibration factors
- Printed IOM Manual (when ordered)
- Calibration certificate (when ordered)

Installation

The PTZ-BOX 3.0 can be supplied with equipment for wall mounting or for bracket mounting on the gas pipe or on the gas meter. A thermowell with weldolet can be included in the order.

For the best metering practice the temperature sensor should be located close to the gas meter: Downstream of a gas turbine meter or upstream of a rotary gas meter. For custody transfer applications in many countries, a second thermo-well and a three-way-valve in the pressure line are needed. vemm tec gas meters can be provided with a thermo-well integrated in the meter body.

Verification and Calibration

The factory verification certificate according to 2004/22/EC (Measurement Instrument Directive) is sufficient when a calibration document is required.

Legal calibration certificates for separate countries can be provided on request.

Optional Equipment

- Infrared head with cable to be used for easy read out and configuration via computer (USB or serial connection)
- Cables for connecting RS 232 or RS 485
- Intrinsically safe communication modules and power supplies (also combined, several models available)
- Analogue output module 4 – 20 mA (one for each analogue output)
- Modem assemblies, for location in the hazardous area or in the safe area complete with power supply, barriers and safety modules, configuration according to your specifications
- Thermo-wells, thread-o-lets, two-way-valves, three-way-valves and other accessories
- Gas meters of all kinds

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PTZ-BOX 3.0: Technical specifications

Enclosure	Dimensions: 170 x 170 x 75 mm Weight: 1.2 kg Material: Lexan® IP 65: According to EN 60529 Prepared for dedicated mounting bracket, hidden glands
Operating conditions	Temperature: -25 to +60 °C Ambient temperature: -25 to +70 °C Storage temperature: -40 to +85 °C
Power Supply	Standard SAFT LS33600 (only) Lithium battery (D-size 3.6V / 17 Ah) Typical life time with battery power: 6 to 8 years (depending on configuration) Optional: External (IS) power supply 4.7 to 10.0 VDC Life time backup battery: 10 years
Inputs Pulses Pressure sensor Temperature sensor	4 digital inputs for pulse or status, single or dual pulse stream of one gas meter, LF (Reed, Wiegand) or HF (NAMUR) signals, encoder input LF 10 Hz maximum frequency HF 5 kHz maximum frequency (HF signals require external power) 1 internal or external pressure sensor. Standard ranges: Limited ranges: 0.8 - 5.2 bar(a) 0.8 – 2.5 bar(a) 2.0 - 10 bar(a) 1.5 – 5.2 bar(a) 4.0 - 20 bar(a) 3.0 – 10 bar(a) 7.0 - 35 bar(a) Extended ranges: 14 - 70 bar(a) 0.8 - 10 bar(a) 4.0 – 70 bar(a) Connection: 6 mm Ermeto M12x1.5 1 temperature sensor Pt-1000 ø 5.7 mm, L= 50 mm One additional pressure sensor or temperature sensor can be connected
Scanning frequency	Measurement period can be set between 1 and 60 seconds
Display and buttons	Graphical LCD display with backlights (128 x 64 pixels), showing all settings and values. 6 buttons for navigation, 4 user configurable Quick Access Buttons. Specific parameters can be changed via the key pad
Calculation	Calculations according to EN 12405, AGA 7 and ISO 6976. Compressibility according to: AGA NX 19 (mod) AGA 8 G1 or G2 AGA 8-92 DC (full composition) SGERG 88 or fixed value

Accuracy	Base volume: < ± 0.15 % under reference conditions < ± 0.50 % in the whole specified pressure and temperature range
Registers Monthly Daily Custom Binary archive Extremes Settings	1 MB 25 monthly records 400 daily records records with programmable intervals of 1 second to 1 hour; size depending on remaining memory capacity. (For every register the stored values can be selected) 500 records of events Records of max. and min. values 500 records of setting changes
Outputs Binary outputs Serial outputs	4 output channels, configurable for pulse streams, status or signal to analogue output modules Infra-red port IEC-1107 RS 232 port RS 485 port Communication speed selectable between 9.6 and 57.7 kBd (Infra-red port 9.6 - 38.4 kBd)
Alarms	The error status is fully configurable. Alarms can be raised for high or low values, for internal errors or for external events. Warning message to dispatch computer possible.
Intrinsical safety	II 2G EEx ia IIC T4/T3 Approval: FTZÚ 11 ATEX 0015X
Metrological approvals	2004/22/EC (MID) approval: TCM 143/11 - 4834
Protection against manipulation	The device can be protected by seals and/or by passwords (several levels)
Software	The included software package enables configuration and read out of devices via modem and computer. Tariff counters, energy counters, communication, archiving and curve correction are user configurable. Values can be exported to several standard software packages (Excel, Access, Paradox, Foxpro), to text formats, CSV or to XML. For extended systems dedicated software can be provided.
Data exchange	DCS and Scada systems can access the device via Modbus RTU, TCP/IP or via optionally dedicated protocols.

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