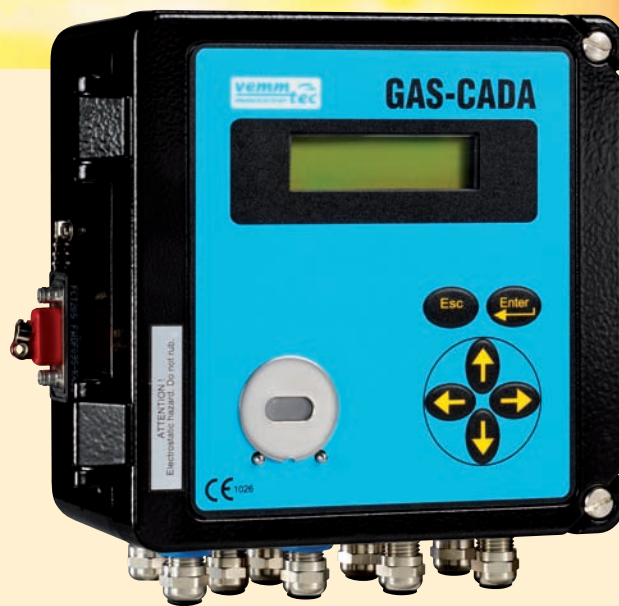


GAS-CADA High Level Electronic Volume Converter Documentation and Technical Specifications



Advantages

- High level conversion device for gas volume meters (approved for custody transfer)
- Relevant type approvals available
- Low cost / high performance
- Suitable for 1 or 2 gas meters
- High or low frequency pulse inputs
- Internally or externally mounted pressure transmitters
- Digital communication with pressure transmitters and temperature probes
- Software for Windows™ included
- Extended communication options
- Specific designs for zone 1 and zone 2
- Several compressibility calculation methods, including the full composition AGA 8 calculation
- The GAS-CADA complies with EN 12405 and other international standards

Display

The device is equipped with an alphanumeric display with 2 lines of 16 characters. It is operated by the 6 buttons on the front panel. Actual values, stored values, metrological and configuration data as well as status indications can be accessed at the display. Some of the menus are user configurable.

Operation

The GAS-CADA is a battery or line powered volume converter for gas volume measurement applications. Applications are with all gas flow meters that generate volume pulses. Up to two gas meters can be connected to one GAS-CADA.

It is equipped with digital, energy-saving pressure and temperature sensors. The pressure transmitter can be fitted inside the case of the GAS-CADA or mounted externally. The maximum cable length between GAS-CADA and all its sensors must be shorter than a total sum of 100 m.

GAS-CADA calculates the compressibility factor Z of the gas as well as the conversion factor C with the measured pressure and temperature. From these values given, it calculates the volume at base conditions, the base flow rate and the actual flow rate. All calculations are performed according to EN 12405.

The compressibility factors Z and Z_b may be fixed for all gas types or calculated according to several methods for natural gas:

- $Z/Z_b = 1$ (Ideal gas) or $Z/Z_b = \text{const.} \neq 1$
- AGA NX 19 mod.
- AGA 8 G1 or G2
- AGA 8-92 DC (full composition)
- SGERG 88

Communication

The GAS-CADA can be easily configured and read out by using the included software and a PC or notebook. Available serial interfaces are IrDA® / IEC1107 infrared as well as RS 232 and RS 485 cable connections. By means of these interfaces the device can be connected directly to a computer or via a line modem, GSM modem, radio modem or GPRS connection. Local read out can also be performed by using a handheld computer (PDA). In zone 1 you must use RS 485 connection in combination with a suitable IS barrier (see "Additional Equipment").

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

Digital Inputs and Outputs

Eight digital inputs are available. Four of them are configurable as low frequency, high frequency or binary inputs. The other four are binary inputs.

The GAS-CADA has four digital outputs, configurable either as binary output or as pulse output with adjustable frequency and pulse width. These outputs are programmable as flow related signals, alarm signals or as status indication (open door, valve position, etc.). Which means, they can be used for controlling odorization installations or other flow related devices.

Memory

All data is stored in FLASH memory that provides storage capacity for

- 25 monthly records
- 100 daily records
- Minimum 143000 custom data archive records with freely programmable intervals of 1 second to 1 hour
- Binary, extremes and setting archive

Power Supply

The standard power supply is a lithium battery. The life time of the battery is typically between 6 to 9 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 during discharge or replacement of the main battery will be intact.

As an option, the GAS-CADA can be powered by an intrinsically safe power supply. The battery will provide power, in case of line power failure.

Documentation

Each GAS-CADA is provided with the following documentation:

- IOM Installation, Operation and Maintenance Manual (hardcopy)
- CD-ROM with
 - IOM (manual as PDF-softcopy)
 - Software for configuration and read out
- Specification data sheet with the preset parameters of the measuring system

Installation

The GAS-CADA is delivered with equipment for wall mounting or for mounting at the gas pipe. A weldolet with thermo-well is supplied for every temperature sensor (common sizes and threads). Spare fuses will also be provided.

The temperature probe needs a thermo-well 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. The vemm tec gas meters can be provided with a thermo-well in the meter body, but this is not permitted by some local metrological services.

Initial Verification and Calibration

The optional factory calibration certificate is often sufficient when a calibration document is required.

NMi initial verification certificate can be supplied as an option.

Legal calibration certificates for other countries are available on request

Optional Equipment

- Infrared head for IrDA® serial interface, to be used for easy read out and configuration via PC or notebook (USB connection requires a converter), 2.5 m or 12 m cable length
- Cables for connecting RS 232 or RS 485 or cables for longer distance between GAS-CADA and the sensors
- Intrinsically safe communication modules and power supplies (also combined, several models available)
- Analogue output module 4 – 20 mA
- Telemetric modules complete with power supply, modems, barriers and safety modules, configuration according to your specifications
- Thermo-wells, thread-o-lets, three-way-valves and other accessories



High Level Electronic Volume Converter GAS-CADA with pressure and temperature probe

Table: Technical specifications GSA-CADA

Enclosure	Dimensions: 160 x 160 x 90 mm Weight: 2.5 kg Material: Aluminium AlSi10MgMn IP 65: According to EN 60529
Operating conditions	Temperature: -25 to +60 °C Storage temperature: -40 to +85 °C
Power	Dedicated intelligent Lithium battery Life time with battery power: 6 to 8 years typically (depending on the conditions) Optional: External power supply (IS) 4.7 to 10.0 V DC Backup battery life time: 10 years
Inputs Pulses	8 digital inputs for pulse or status, single or dual pulse streams of one or two gas meters, LF contact closure (Reed, Wiegand) or HF NAMUR signals LF 10 Hz maximum frequency HF 5 kHz maximum frequency (HF signals require external power)
Pressure transmitter	1 or 2 internal or external digital pressure transmitters with Modbus protocol, with the following ranges: 0.8 - 5.2 bar(a) 4.0 - 20 bar(a) 2.0 - 10 bar(a) 7.0 - 35 bar(a) 14 - 70 bar(a) Other ranges on request Connection: 6 mm Ermeto M12x1.5
Temperature probe	1 or 2 digital temperature probes with Modbus protocol
Sample frequency	Measurement period can be set between 1 and 30 seconds
Display	LCD with 2 rows of 16 alphanumeric characters, showing actual values, stored values, settings and errors
Calculation	Compressibility calculation according to EN 12405 and other standards: 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 range of pressure and temperature sensors

Registers Monthly Daily Custom	750 kB 25 monthly records 400 daily records Interval of 1 second to 1 hour (The stored values can be chosen for every register). Number of records, depending on the number of values selected for storage
Binary archive Extremes Settings	2000 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 (quantities, odorization) or status (errors, controls) Infra red port (IS) IEC-1107 or IrDA® alternatively as an option RS 232 port (not intrinsically safe) RS 485 port (IS) Communication speed selectable between 9.6 and 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 that generate a binary signal.
Intrinsic safety certificates	II 2G EEx ia IIC T4/T3: FTZÚ 05 ATEX 0270 II 3(2)G EEx nA [ia] IIC T4/T3: FTZÚ 05 ATEX 0271
Metrological approvals	Netherlands Measurement Institute (NMI) T6793, TC3571 and others
Protection against manipulation	A password is required to change the settings. The sealable configuration switch must be put to the "set" mode. The device can be protected by seals (user or metrological service).
Software	The included software package enables configuration and read out of the device. Values can be exported to several standard software packages (Excel, Access, Paradox, Foxpro) or to text formats or XML.
Data exchange	DCS and Scada systems can access the device via Modbus RTU or via optionally dedicated protocols.



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