TEC-I

Volume conversion device

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TEC-I Volume Conversion Device

TEC-I is a gas volume corrector that enables PTZ, PT or T conversion. The device is designed to measure volume, energy and flow gas. Primarily battery powered with the possibility to connect external power supply. The device converts the volume of gas counted by the gas meter (turbine, rotary, ultrasonic) into the base conditions. Gas compressibility factor is calculated with the use of algorithms SGERG-88, MGERG-88, AGA8-92DC, AGA8-G1, AGA8-G2, AGA NX-19 mod or constant value of relative compression factor. TEC-I is an intrinsically safe device ready to be installed in explosive hazardous zone 0.

Main features of the TEC-I

- Industrial housing cooperates with various type of gas meter like turbine, rotary, ultrasonic by LF, HF, Namur, Encoder, Wiegand
- 4 independent serial transmission ports (2xRS485 + OPTICAL INTERFACE 62056-21 + NFC IEC 14443)
- Built-in GSM/GPRS/3G/LTE modem (option)
- Backlight graphic display
- 5 configurable binary Ex inputs
- 2 configurable binary NAMUR Ex inputs (operating on battery mode)
- Binary and frequency outputs
- Internal or external pressure transducers available
- More than 10 years of archive registered data storage (with monthly sampling interval)

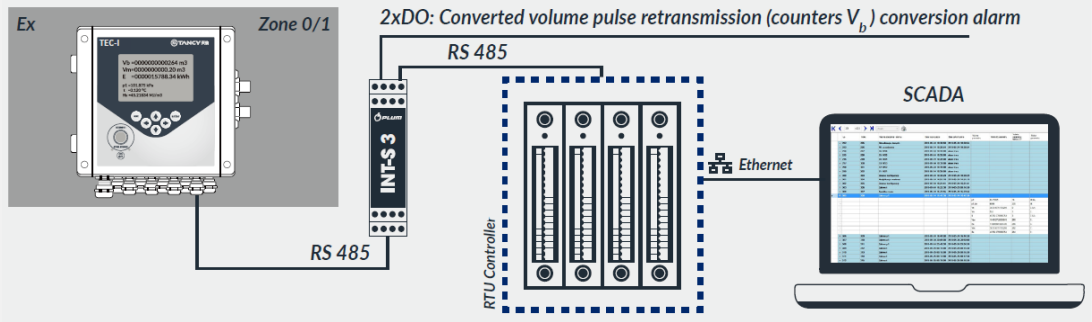
Technical specifications	
Dimensions :	206x194x76 mm
Weight :	1.5 kg
Housing material :	Polycarbonate enclosure (version 1) or metal (version 2)
Relative humidity :	max 95% at temp. 70°C
Ambient temperature range :	-25°C up to 70°C
Housing protection class :	IP 66 (for outdoor installation)
Keyboard :	6 pushbuttons (version 1) or 18 pushbuttons (version 2)
Display :	LCD – graphic 4" with backlight
Ex classification :	Ex II 1 G Ex ia IIB T4 Ga Certificate FTZU 19 ATEX 01317X
Internal EVC supply :	D-size lithium battery 3.6V/17Ah (up to 3 batteries in version without modem), operating time: One battery: 5 years
Internal GSM supply :	Two D-size lithium batteries 3.6V/17Ah, operating time: 5 years (two communications per day)
External supply :	Intrinsically safe power supply and transmission interface INT-S3 (RS485, Supply output 5.7V, 2 digital inputs/ outputs, Supply input 11÷30V DC)
Transmission ports	• 2 independent serial transmission ports, speed up to 256 000 b/s: COM1, COM2 standard RS-485 • Optical Interface IEC 62056-21 • NFC interface IEC 14443 • GSM/GPRS 2G/3G/LTE (option)
Transmission protocols :	MODBUS RTU, MODBUS TCP (in version with internal modem),MODBUS RTU (MASTER MODE), GAZMODEM, GAZMODEM (MASTER MODE). Other protocols can be used on request.
Environment conditions class (Mechanical/Electromagnetic) :	M2/E2
Base conditions :	Adjustable by authorized service personnel, available options : • Base pressure(absolute) pb: range (1,00÷1,02) bar,default 1,01325 bar • Base temperature Tb: range (270÷300)K, default 273,15K (0°C) • Reference temperature for combustion process T1:range (270÷300) K, default 298,15K (25°C)
The maximum permissible error (MPE) according to standard"EN 12405-1" :	0,5% at reference conditions 1% at nominal operating conditions typical error < 0,15%
The maximum permissible error (MPE) according to standard"EN 12405-2" :	ECD Class A
Used algorithms for calculations of compression factor :	SGERG-88, MGERG-88, AGA8-92 Detailed Composition, AGA8-G1, AGA8-G2, AGA NX-19 mod constant compression factor K1
Registration periods :	• Data registered periodically : logging interval from 1 up to 60 minutes – 24000 records • Hourly data : more than 2 years • Daily data : more than 3 years

	• Monthly data : more than 10 years • Events memory : approximately 4000 records (segmented for 2 sectors)
Meets the requirements specified in Standard 2004/22/WE (MID)	
Inputs :	• 6 Ex digital inputs – to cooperate with Potential-free junctions, shared with : - 2 LF inputs, frequency 0÷60Hz, reed contact, WIEGAND - 1 TS tamper protection switch (closed by default) • 2 Ex digital inputs, NAMUR type, shared with: - 2 HF inputs, frequency 0÷5000Hz EN60947-5-6, a possibility of temporary work on battery - 1 ENCODER (NAMUR type) • 1 SCR ENCODER • Pressure sensor p1 (internal or external) – measurement range in standard option – up to 6 bar. End of the sensor is a metric screw thread M12x1.5 (Ermeto), pressure range: 0.8÷6/0.8÷10/2÷10/4÷20/7÷35/4÷70/10÷70/10÷100/bar abs. Maximum permissible errors for measurements of p 20°C (±3°C) (-25÷70) °C ±0.2% of measured value ±0.5% of measured value • Temperature sensor Pt1000 class A or B, 2-wire or 4-wire (with the cable length compensation), diameter 5.7 mm. 20°C (±3°C) (-25÷70) °C ±0.1% ±0.2% • Pressure sensor p2 (internal, optional) – absolute or gauge, ranges from 0÷100mbarg to 10÷100 bar abs • 2 digital pressure or temperature transducers (external, working on battery mode)
Control outputs :	• 4 Ex digital outputs (separated): - 1x configurable – binary or frequency (0-5000Hz), Counters: V_b, V_m, E - 3x configurable binary

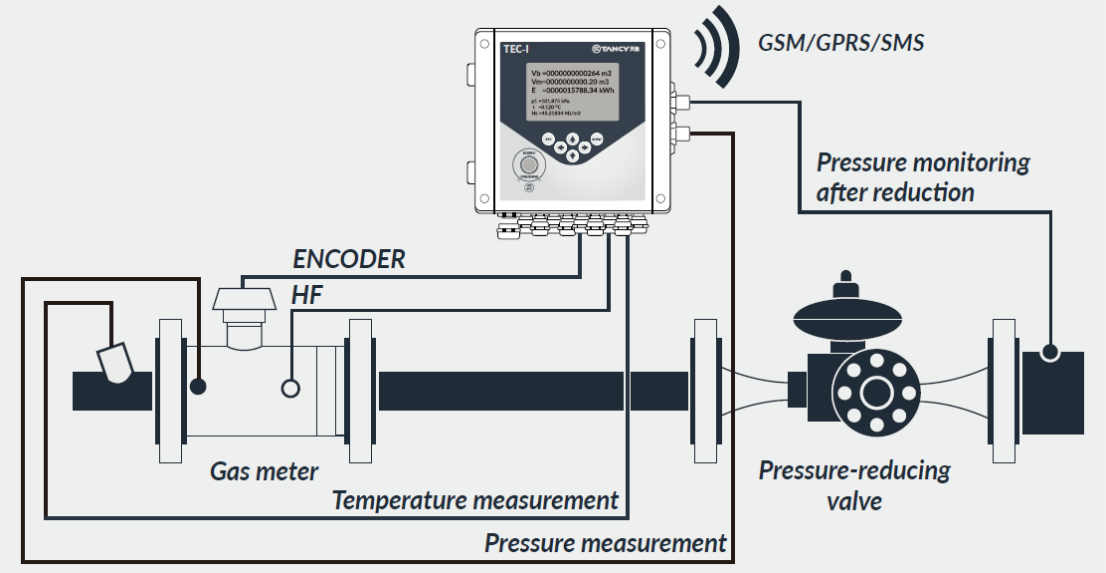
Communication

1. Direct transfer of data to system – Data readout through internal GSM/GPRS modem with the use of internal batteries

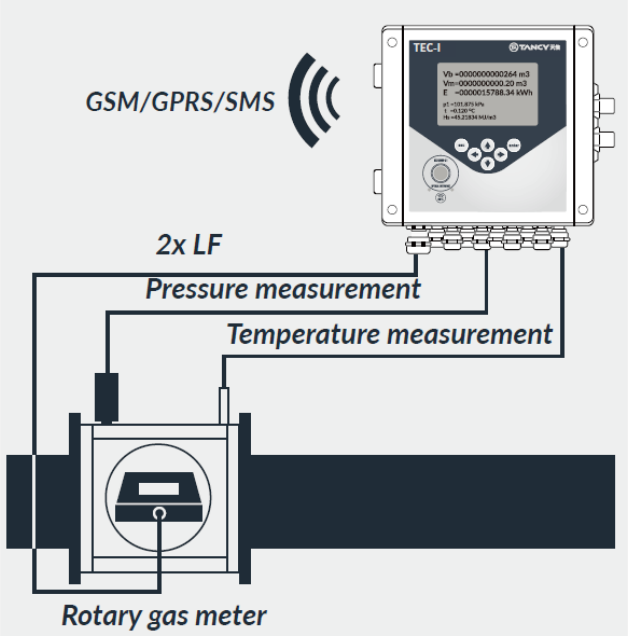
2. Remote data readout – connection through communication interfaces INT-S3, RTU controller independently



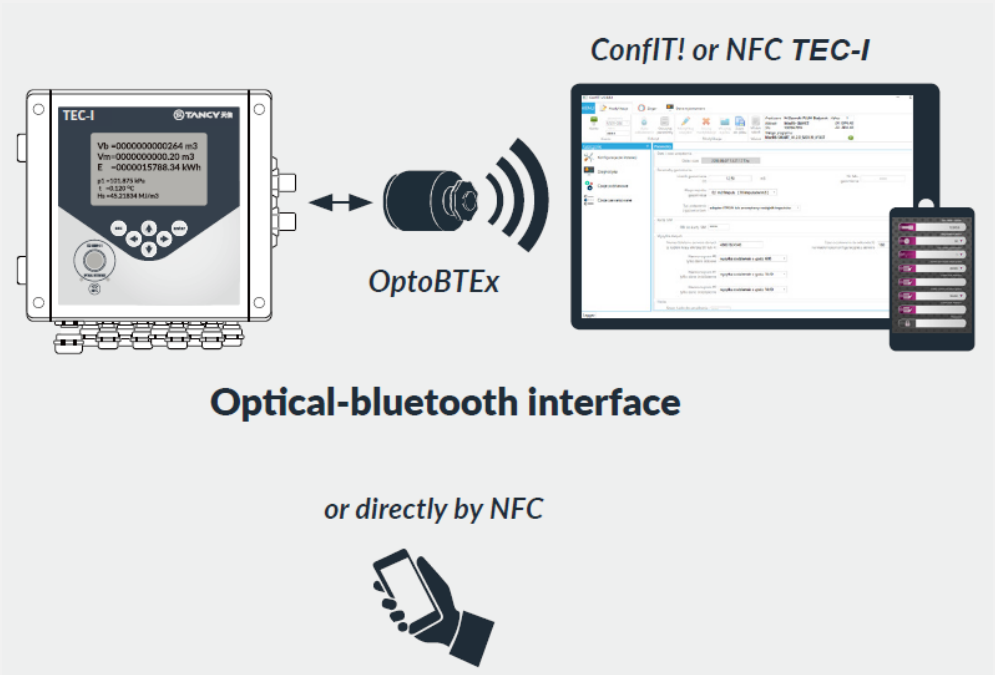
3. Process of measurement using TEC-I and turbine gas meter



4. Process of measurement using TEC-I (with external pressure sensor) and rotary gas meter



5. Local readout and configuration



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