

# EK280 IT

Volume conversion device  
with tariff and data logging function  
and integrated GPRS modem

## Applications

- Volume conversion for billing purposes
- Data logging by different tariffs
- Automatic data transfer to head end system

## Brief information

The EK280 IT is a battery-operated volume conversion device. It can be used with all kinds of gas meters such as diaphragm, turbine or rotary gas meters. The device calculates the conversion factor C and the compressibility K on the basis of the consumption data supplied by flow-proportional pulses from the connected meter and the analogue measurements of gas temperature and gas pressure. The volumes and flow rates under standard conditions and the operating flow rates can be calculated using this initial data.

The EK280 IT consists of a central unit with either an integrated or external pressure sensor as well as a temperature sensor. The sensors are permanently connected to the unit. The compressibility K can be programmed as a constant for all gases or calculated according to various methods of calculation.

The integrated sophisticated data logging function records the consumption data by different tariff levels. An event logbook is used to store all significant events such as clock synchronization, component failures, modification of parameters or tariff programs, etc. The current meter readings, measured values and parameters can be shown on a graphics display. The menu structure is self-explanatory. User-friendly navigation in the menu is guaranteed by 6 function keys.

Data communication is ensured by a battery-operated GPRS modem. The readout session can be initiated by the device, which connects to a head end. After reading the requested data, the modem is set back to low-power mode immediately. This is the most energy-efficient communication mode. The device may also be parameterized by the head end system, allowing for remote configuration of tariff programs and installation settings. The possibility of remote firmware upgrade in accordance with WELMEC Guide 7.2 guarantees future-proof functionality following installation.

The EK280 IT offers data access security controls for access to the data, and data transport security as messages are exchanged with cryptographic protection. With role-based access/interaction to/with data objects and peer authentication between the communication partners, two mechanisms are available for access security control. The EK280 IT's data transport security features enable end-to-end security by utilizing the latest industry standards defined by the selected DLMS Companion Specification for Energy Metering suite of standards. Message authentication and data encryption are based on the Advanced Encryption Standard (AES-128) algorithm using the Galois/Counter Mode (GCM). This method ensures that there is an adequate level of privacy and thus offers excellent protection against disclosure of information to unauthorized parties. In addition, secured key exchange by key wrapping is supported by the EK280 IT.

The batteries as well as the communication module are replaceable in the field, even if the device is in operation. So the remote firmware upgrade and exchangeable communication module ensure the EK280 IT can be upgraded in the event of new regulations or when new technologies for data communication become available or necessary.



## Main features

- Conforms to European Standard EN 12405
- Conforms to Italian Standard UNI-TS 11291
- MID approval
- ATEX approval for use in Zone 1 (including GPRS modem)
- Compressibility calculated in accordance with different methods
- Integrated data logger with tariff functions
- Mains-free operation
- Six digital inputs
- Four digital outputs
- Modular design Battery-operated GPRS module for remote data transfer
- Communication protocol DLMS Companion Specification to DLMS/COSEM



- Optical interface for parameterization and readout (IEC 62056-21)
- Integrated serial interface can be used in RS232 or RS485 mode



| Technical data          |   |
|-------------------------|---|
| Housing                 | Cast aluminium, wall or meter mounting  |
| Dimensions              | H 180 mm x W 280 mm x D 115 mm (including connections)  |
| Weight                  | Approx. 2.8 kg (including batteries)  |
| Metrological approval   | MID Approval<br>Conforms to the European standard EN 12405-1:2011-04  |
| ATEX approval           | Zone 1, Ex ia IIB T3 with integrated modem<br>Zone 1, Ex ia IIB T4 without integrated modem   |
| Protection class        | IP 65 (suitable for outdoor installation)   |
| Ambient conditions      | Temperature: -25 to +55 °C  |
| Device batteries        | 2 lithium battery modules, capacity: 13 Ah (Elster type 73015774 or 73020663)<br>(service life > 5 years under standard operating conditions)<br>2 additional batteries as an option  |
| Modem battery           | 1 lithium battery module, capacity: 16 Ah (Elster type 73021211), if an internal GSM/GPRS modem is to be used   |
| External power supply   | 7.5 – 8.5 V DC, I < 40 mA mains power supply unit   |
| Control panel           | Keypad with 7 buttons   |
| Display                 | 200 x 80 dot backlit graphics display   |
| Inputs                  | 6 digital inputs for connecting LF pulse generators and message signals (e.g. manipulation contact)   |
| Pressure sensor         | Type ENVEC CT30, integrated in housing or, as an option, provided as an external sensor<br>Connection for precision steel pipe (Ermeto 6L) or flexible pressure tube, M12 x 1.5 thread<br>Pressure ranges* 0.7 – 2 bar / 0.8 – 5 bar / 2 – 10 bar / 4 – 20 bar / 8 – 40 bar / 14 – 70 bar<br>* Other pressure ranges on request |
| Temperature sensor      | Pt-500 resistance thermometer according to EN 60751, Class A<br>Temperature range: -30 °C to +60 °C<br>With protective tube for use with thermowell<br>Installation length: 50 mm, Ø 6 mm, length of supply cable: 2.5 m (10 m as an option)  |
| Compressibility         | Calculation in accordance with S-GERG 88, AGA 8 (GC1 or GC2), AGA NX-19,<br>AGA-NX19 following Herning & Wolowsky or fixed  |
| Archives                | Load profile for hourly values, capacity: 4800 records<br>Load profile for daily values, capacity: 200 records<br>Load profile for current and previous billing periods<br>Archives comply with Italian Standard UNI TS 11291-4   |
| Logbooks                | Event logbook<br>- Recording of non-periodic events, capacity: 1000 records<br>Certification data log<br>- Recording of changes of certain parameters and values, capacity: 1000 records  |
| Signal outputs          | 4 digital transistor outputs  |
| Data interface          | Optical interface in accordance with IEC 62056-21<br>Internal serial interface usable in RS232 or RS485 mode  |
| Communication module    | GPRS modem (quad band 850/900/1800/1900 MHz),<br>for wireless point-to-point communication, even if the volume corrector is installed in a<br>zone 1 hazardous area   |
| Communication protocols | DLMS Companion Specification to DLMS/COSEM (Blue Book 10), Certification No. 1196.<br>Data encryption based on AES-128 using the Galois/Counter Mode (GCM).<br>Firmware download in accordance with WELMEC Guide 7.2.<br>Other communication protocols on request   |

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**EK280 IT EN02**

A21.02.2012

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