This product is discontinued!

EK260

Electronic volume corrector with integrated data logger

Applications

Volume correction including compressibility calculation
Data logging function with peak-load display
Integration in remote data transfer systems

Brief information

The EK260 is a battery-operated volume corrector. It can be used with all gas meters such as diaphragm, turbine or rotary gas meters. As an alternative to recording the flow-proportional pulses for the operating volume, the EK260 can also read the original meter readings from the Absolute-ENCODER index of a gas meter. The volume corrector calculates the conversion factor C and the compressibility K on the basis of the consumption data and the analogue measurements of gas temperature and gas pressure. The standard volumes, standard flow rates and operating flow rates can be calculated using this initial data.

The EK260 consists of a central unit with either an integrated or external pressure sensor and a temperature sensor which is 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 volume corrector can be used in a wide variety of applications involving natural gas measurements thanks to a flexibly configurable serial interface and four programmable digital outputs.

The integrated flexible data logging function allows the consumption profile to be recorded and the peak-load values of a day or of a measuring period to be stored in monthly intervals.

Absolute-ENCODER technology

The volume corrector EK260 can be connected to the Absolute-ENCODER index S1 on a turbine or rotary meter. This means that the original mechanical meter readings from the primary measuring instrument are used to correct the volume and register the data. Missing or excess volumes that occasionally occur during pulse transfer processes due to reverse operation, bouncing pulses or electromagnetic interference can therefore not occur. The combination of gas meter with Absolute-ENCODER index and EK260 will also work with battery power to make regular control readings of the gas meter redundant.

Main features

- System volume corrector
- Conforms to European standard EN 12405
- MID approval
- Flexible data logging functions with peak-load display
- Various logbooks
- Compressibility calculated in accordance with S-GERG 88, AGA 8 (GC1 and GC2), AGA NX-19 or programmable as a fixed value
- Connection to Absolute-ENCODER index (option)
- Mains-free operation
- Suitable for use in Zone 1 hazardous areas
- Three digital inputs
- Four freely programmable, sealable digital outputs
- Optical interface (IEC 62056-21)
- Flexibly configurable serial interface RS232 or RS485
- Various communication protocols
  - IEC 62056-21
  - Modbus

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Display and operation

The current values and parameters can be shown on the two-line, alpha-numerical display and changed if required. The use of four arrow keys guarantees simple navigation of the data arranged in lists. Each value is displayed with a clear description and the relevant unit.
For everyday operation, the most important values are combined in a configurable user list. The display range can be limited to this list of current meter readings and essential operating parameters, which will guarantee simple operation of the volume corrector at the metering point.

Data logging function

The integrated event-triggered data logger supports three independent archive functions.
In the first monthly archive, the meter readings and consumption maximums are stored. In the second monthly archive, maximum, minimum and mean values for operating and standard flow rates and for gas pressures and temperatures are recorded in some cases. Each of these archives has a storage capacity of 15 months.
In the measuring period archive, the mean values of the measuring period for pressure, temperature, K value and C value are stored, in addition to the meter readings of the operating and standard volume counters. Each entry made in an archive will receive a time stamp with the date and time. The measuring period can be set between one minute and one month. More than nine months of data can be stored when applying 60 minute intervals (7000 entries).

Logbooks

The EK260 has three logbooks to ensure traceability of operating status, status changes and settings.
The event logbook is used to record the last 250 status changes.
The last 200 changes to values and parameters are entered in the change logbook (audit trail). The old and new parameters are recorded in addition to the time of the change. In addition, the access rights under which the change was carried out are also recorded (calibration, supplier or customer lock).
The technical calibration logbook allows changes to be made to certain calibration-relevant values or parameters such as the cp value, without the calibration switch having to be opened. Up to 50 changes are registered in this logbook with a time stamp. If the maximum number of records is reached, further amendments are only possible after deleting the logbook with the calibration lock being open.
Basically all archive and logbook entries can be displayed on the device display without additional tools being required.

Communication interface

Local programming or readout of the unit is performed via the optical interface (IEC 62056-21) on the front panel. In addition, the device features a flexibly configurable serial interface (RS232/RS485) for the permanent connection of a modem or other communication equipment. The volume corrector can thus be integrated into various applications and remote data transfer systems.

Communication protocols

The EK260 supports various communication protocols. Invoice-relevant data or process and operating data for network management can therefore be used simultaneously in many established central call-up systems and EDM systems.
Using the communication protocol in accordance with IEC 62056-21, all parameters can be read and changed and the archives can be read out.
As an alternative, the Modbus protocol can also be used for data communication via the internal interface, which allows connection to SCADA systems. RTU and ASCII operating modes are supported. In order to guarantee the greatest flexibility as regards different requirements, the data elements, associated indicators and data formats can thus be freely configured.
All protocol information is disclosed and is available on request for the development of own applications.

Additional functions

Two additional digital inputs can be used either as pulse inputs (input 2) or status inputs for various applications, such as station monitoring and pulse comparisons, for example.

Four freely programmable digital outputs enable a range of information to be transmitted. When programmed as pulse outputs, they allow the volume pulses determined for a metering cycle to be forwarded in the form of pulse packets. When used as status outputs, messages and warnings can be signalled on the basis of different results (e.g. exceeding the minimum or maximum consumption values or measured values). The outputs can be secured against unauthorised changes by either a customer lock, supplier lock or calibration lock.

Power supply

The power supply for the unit is provided by two lithium batteries. In standard operation (pulse input), the batteries have a service life of 5 years. This can be doubled by using two additional batteries. The current operating status of the EK260 is taken into account when calculating the remaining battery capacity. If the battery life is 3 months or less, the corresponding indication appears in the display. This information can also be called up via the status register. The batteries can be replaced without loss of data or damage to the seals.
If the volume corrector is connected to an external power supply, the batteries remain in the unit and guarantee the unit functions, including if there is a failure of the external power source.

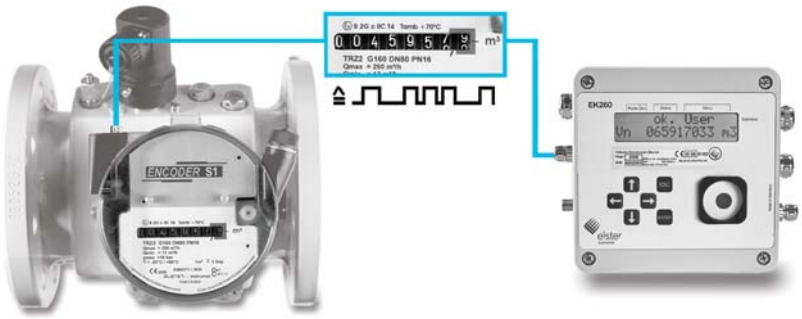
Version

For wall mounting, the housing of the EK260 is equipped with boreholes. It can also be fitted directly to the meter or gas pipe using an attachment bracket.

Accessories (modems)

An EK260 installed in an explosion-hazard area can be integrated in remote data transfer systems using the function extension unit FE260. The industrial modem EM260 is particularly suited for remote data transfer in non-explosive areas under difficult ambient conditions in energy supply companies and in industry. The modular concept of these units allows various interfaces to be used to connect other devices as an alternative to the modem. Function extension unit FE230 is a battery-operated GSM modem which allows data communication without an external voltage supply.

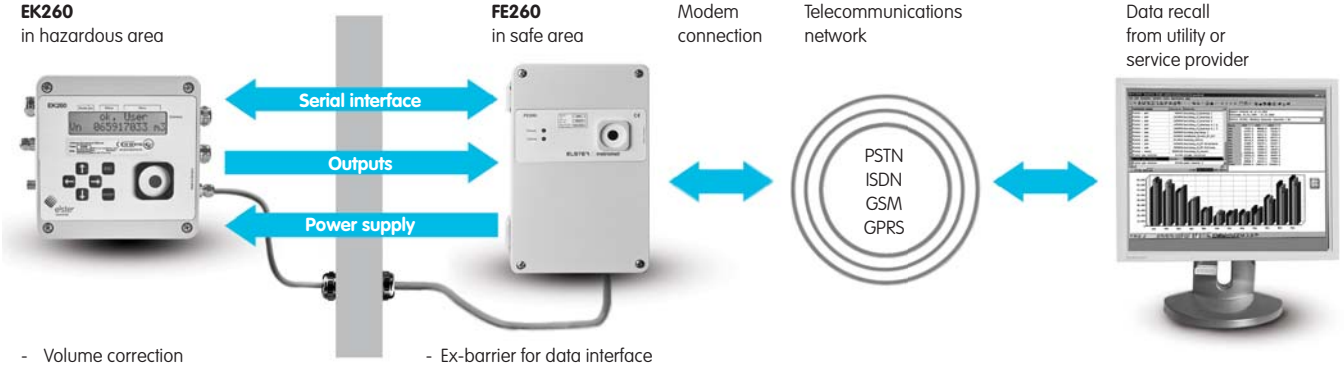
EK260 connected to Absolute-ENCODER index S1 (Namur)



- Digital transmission of the original meter reading by contactless optical readout
- No errors caused by reverse operation, bouncing pulses or electromagnetic interference
- Meter readings must no longer be checked and adjusted
- Energy supply of the Absolute ENCODER via the EK260
- Approval for Zone 1 hazardous areas
- Ideally suited to remote data transfer

Schematic representation of the transmission of original meter readings to the battery-operated volume corrector EK260 using the NAMUR interface

FE260 Function extension unit – a flexible interface between volume corrector and energy data management

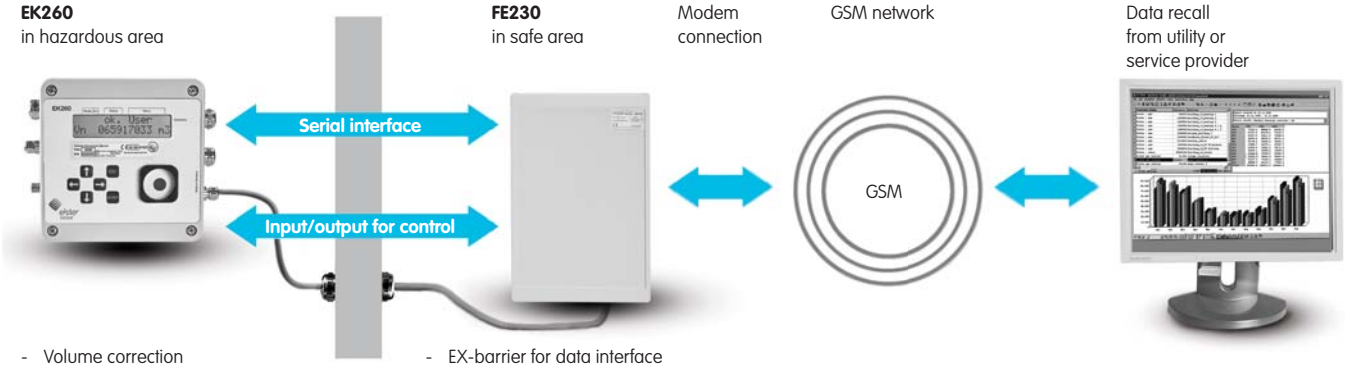


- Volume correction
- Data logging
- Process data

- Ex-barrier for data interface
- Ex-barrier for digital outputs
- Modem (PSTN, GSM, GPRS, etc.)
- Intrinsically safe power supply for EK260

The Ex-barrier of the serial interface and the pulse outputs of the volume corrector is provided by the FE260 function extension unit. In addition, the intrinsically safe power supply of the volume corrector is guaranteed. The unit's modular concept allows the use of a modem for data communication or an interface for connection to other devices.

FE230 Function extension unit – battery-operated GSM modem for data communication



- Volume correction
- Data logging
- Control of power supply for FE230

- EX-barrier for data interface
- EX-barrier for input/output for control of battery supply
- GSM modem

The FE230 function extension unit is a battery-operated GSM modem which allows data communication without external power supply. To optimise the service life of the battery, the volume corrector activates the modem within a programmable, cyclical time window for calling up the data.

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Technical data	
Order number	83462150
Housing	Cast aluminium, wall or meter mounting
Dimensions	H 165 mm x W 165 mm x D 102 mm (not including connections)
Weight	Approx. 2.8 kg (including 2 batteries)
Metrological approval	Conforms to European Standard EN 12405-1: 2005 + A1: 2006 MID - DE-08-MI002-PTB001 volume conversion device
ATEX approval	Zone 1, EEx ib IIC T4
Protection class	IP 65
Ambient conditions	Temperature: -25 to +55°C
Battery power supply	2 lithium batteries, service life > 5 years under standard operating conditions (pulse input) 4 batteries are required for battery operation in ENCODER mode (option). For mains operation in ENCODER mode (option) 2 batteries are sufficient.
External power supply	9 V DC +/-10%, I < 40 mA mains power supply unit
Control panel	Keypad with 6 buttons
Display	2-line dot-matrix display with plain-text description of the values displayed. All parameters, settings and archived values can be displayed.
Inputs	3 digital inputs for connecting LF pulse generators and message signals (e.g. manipulation contact) Input 1 – connection to Absolute-ENCODER index S1 (Namur) possible (option)
Pressure sensor	Absolute sensor, Type ENVEC CT30, integrated in housing or, as an option, provided as an external sensor Connection for precision steel pipe (Ermeto 6L) or flexible pressure tube, M12 x 1.5 thread Pressure ratings 0.7 – 2 bar / 0.8 – 5 bar / 1.4 – 7 bar / 2 – 10 bar / 2.4 – 12 bar / 4 – 20 bar / 6 – 30 bar / 8 – 40 bar / 14 – 70 bar / 16 – 80 bar
Temperature sensor	Pt-500 resistance thermometer to DIN 60751 with protective tube, for use with thermowell. - Installation length 50 mm Ø 6 mm, length of supply cable 2.5 m
Compressibility	Calculation in accordance with S-GERG-88, AGA 8 (GC1 or GC2), AGA NX-19 or programmable as a constant
Archive	Monthly archive 1 - Meter readings and maximums of the last 15 months for V_b and V_m Monthly archive 2 - Maximums and minimums of the last 15 months for Q_b, Q_m, pressure and temperature Measuring period archive - Event-triggered recording of meter readings and measured values with time stamp and status - Recording interval (measuring period) programmable as required (1 minute – 1 month) - Storage capacity 9 months at a recording interval of 60 minutes (7000 records)
Logbooks	Event logbook - Recording of non-periodic events (e.g. time changes with time stamp) - Storage capacity 250 records Change logbook (audit trail) - Recording of all parameter changes with time stamp (old and new values) - Storage capacity 200 records Technical calibration logbook - Recording of changes to calibration-relevant values/parameters with time stamp - Storage capacity 50 records
Signal outputs	4 digital transistor outputs, freely programmable and protectable via calibration lock as - Pulse output for all operating or standard volume meters - Signal output for alarm and/or warning status information - Output 2 as HF output (max. 1 kHz) depending on the load or on an analogue signal
Data interfaces	Optical interface in accordance with IEC 62056-21 (IEC1107) Internal serial interface RS232 or RS485
Communication protocols	- IEC 62056-21 (IEC1107) - Modbus ASCII - Modbus RTU

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