New highlight: volume conversion device EK280

Fit for future requirements

As of the end of the year, the new Elster volume conversion device EK280 will start to gradually replace its successful predecessor, the EK260. And the new addition is a genuine star of the future. Not just its display – the housing is also larger than on the EK260. This allows a GSM/GPRS modem and a power supply unit to be integrated for a whole host of applications. But it has lots of other features as well: connections for additional sensors e.g. HF sensor of a gas meter, additional digital inputs, data interfaces which can be used simultaneously, DLMS/COSEM communications protocol, Modbus PUSH, system monitoring and much more – but let's take a closer look at the new features and options in detail.

New user interface – everything at a glance

The first thing that strikes you is the large graphics display with 200x80 pixels. It is illuminated even in battery mode and therefore easy to read without an additional light source, even in adverse installation conditions. Its operation is based on Windows Explorer making navigation very straightforward. An additional function key enables the user to return to the main screen, clear the status register or freeze the display with ease. Additional symbols provide information about the remaining capacity of the device batteries and the reception field strength of the modem. This means that the user has all the information he needs at a glance (Fig. 1).

Connections to the gas meter – more flexible than ever

In addition to the encoder index (Namur or SCR interface) and low frequency (LF) pulse generators, high frequency (HF) pulse generators are also supported for

Fig. 1: The new display – all the main information at a glance

connection to meters as long as the volume conversion device has an external power supply. This enables you to measure, archive and also monitor flow rates precisely. If the HF pulse generator is used as an input for the conversion process, the LF signal is automatically used as the input signal for the volume conversion process in the event of a failure of the external power supply. This is a function that is normally only available on flow computers – and only then if they are protected from mains failures by an uninterruptible power supply.

The same time-tested pressure and temperature sensors are used as in the predecessor model. The pressure sensor is permanently installed in the housing but external versions can also be supplied. The new feature is that another pair of sensors can be connected – even retrospectively. A second pressure sensor can be used, for example, to monitor the inlet or outlet pressure from a gas measurement system.

Effective data transfer – limitless communication

If the EK280 is used in Zone 1 potentially explosive atmospheres, the function extension unit FE260 can be used as in the past to provide an Ex-barrier for the interface and the outputs as well as to make the power supply intrinsically safe. The familiar communications modules for

Fig. 3: Data interfaces – all good things come in threes

data transfer, in particular the GSM/GPRS modem with the time-tested applications, also continue to be available.

One of the highlights in this respect is the GSM/GPRS modem module which can simply be plugged into the EK280 and can be used in battery mode even in potentially explosive atmospheres (Zone 1).

In Zone 2 potentially explosive atmospheres or in safe areas, the integrated modem module can be used with a power supply integrated in the same housing, removing the limits on its length of use. In other words, compared to its predecessor model EK260 which, for remote reading, had to be connected to an external modem type EM260 (GSM/GPRS) or alternatively to a modem from another manufacturer, the EK280 now offers full functionality in a single device (Fig. 2). That saves time and money both in the stage of procurement and during installation, commissioning and maintenance work.

Several data interfaces – all good things come in threes

The volume conversion device EK280 has three serial interfaces.

1. The design of the optical interface on the front of the device complies with the time-tested standard IEC 62056-21. This interface is generally used for commissioning and configuration purposes.

2. As on the previous model EK260, the device also has a serial interface (which can be set to RS 232, RS 485 or RS 422). This is designed for the permanent connection of the function extension unit FE260 or of communications components from other manufacturers.

Fig. 2: Installation of EK260 with modem EM260 …

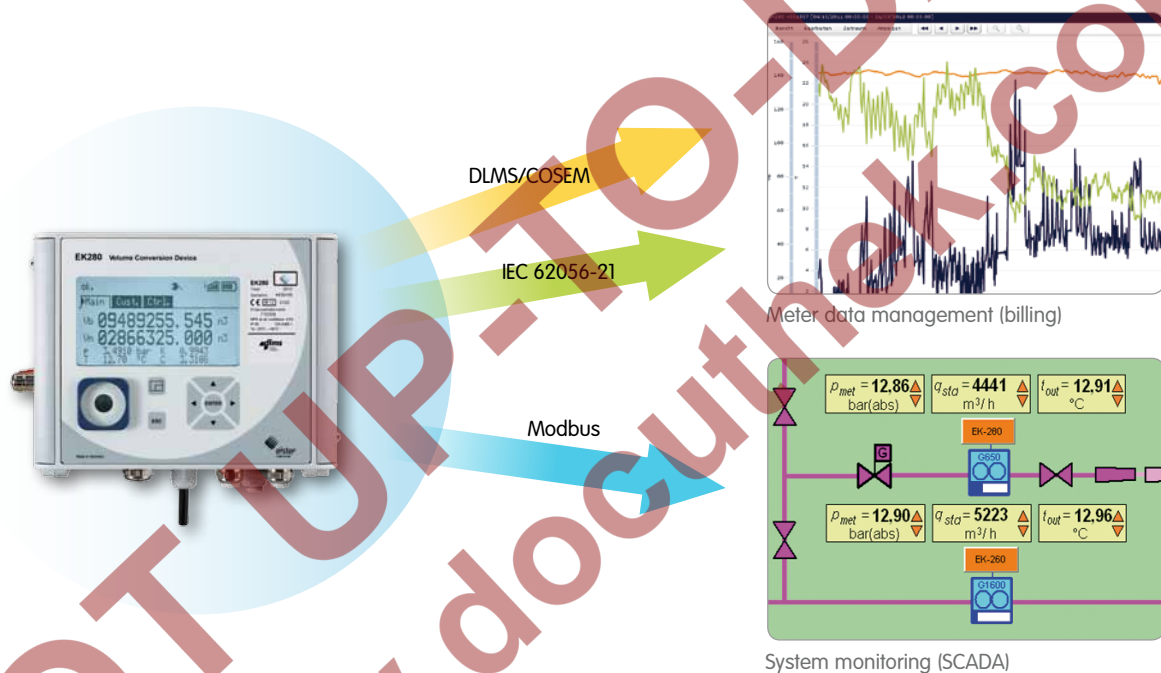… All functions are now integrated in the EK280!

Fig. 4: DLMS/COSEM –
the future of meter
data communication

3. In addition, there is another interface
which takes the form of a connector
to allow integration of the GSM/GPRS
modem module mentioned above in
the EK280 with no additional installation
work. Other communications modules
for this interface will be added to the
product portfolio over time.

The special feature of these interfaces is
that they function completely independ-
ently of each other and can be operated
simultaneously. This is a massive advan-
tage that this device offers over its com-
petitors, for example if two different users
want to read data from the device or if the
device is to be used for both billing and
system monitoring at the same time (Fig. 3).

Fig. 5: Automatic protocol detection with no need for additional configuration

DLMS/COSEM

IEC 62056-21

Meter data management (billing)

Modbus

p_{met} = **12,86** bar(abs) q_{sta} = **4441** m³/h t_{out} = **12,91**°C
EK-280
G650

p_{met} = **12,90** bar(abs) q_{sta} = **5223** m³/h t_{out} = **12,96**°C
EK-260
G1600

System monitoring (SCADA)

Various communications protocols – multilingual is in

The widely used IEC 62056-21 protocol is also used by the EK280. This ensures downwards compatibility with Elster's EK series so that the EK280 can be read by many established MDM systems.

In addition, DLMS/COSEM protocols for transport and application layers are implemented in the EK280 (Fig. 4). In this context, Elster consistently uses international standards for meter data communication and also ensures that future requirements for secure data communication using cryptography can be satisfied. Data modelling is based on the COSEM object model coupled with the OBIS identifier system.
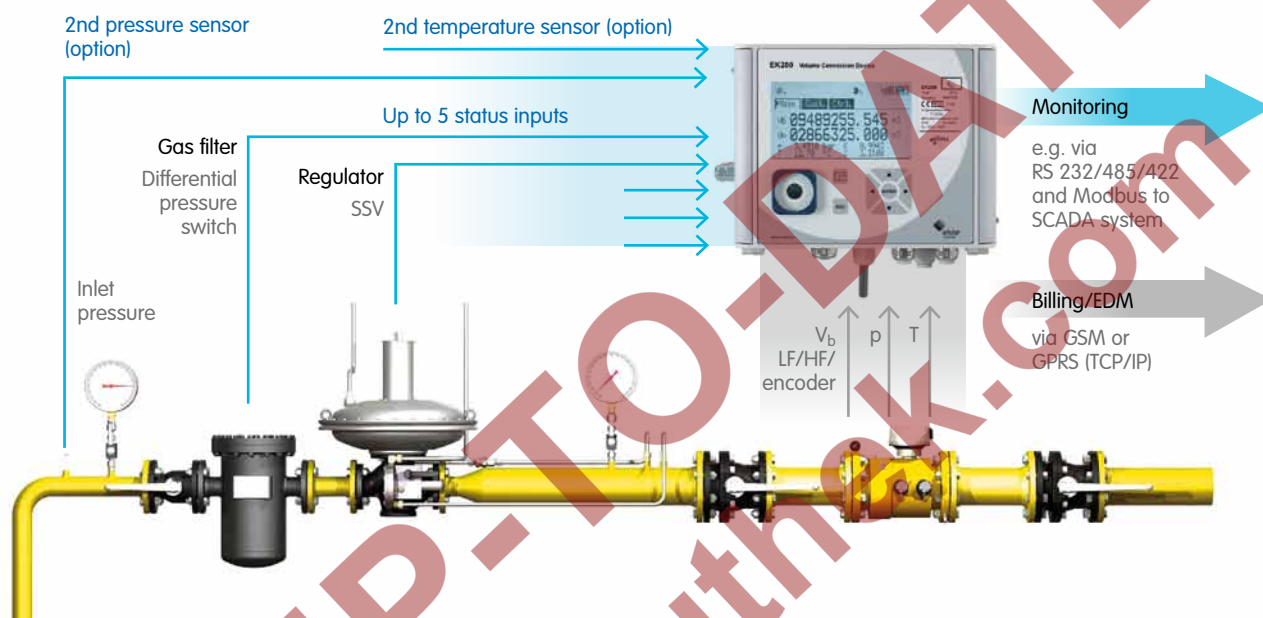
The Modbus protocol is supported in various modes for connection to the remote or SCADA systems. Not only is it possible to query the EK280 (SLAVE), but the device can also transfer data automatically (MASTER) – and all this in battery mode as well.

Another highlight is that the EK280 can command the variety of described data protocols independently, without the need for additional configuration! This means that if a remote meter reading system or SCADA system queries (PULL) the volume conversion device, it automatically identifies which data protocol to communicate with (Fig. 5). Different systems can thus communicate via a single interface although not all at the same time. For this reason, the device is equipped with three interfaces which are all "multilingual"!

Volume conversion and system monitoring – all-in-one

It is in the interests of grid operators and energy suppliers to ensure that the capacity of gas grids is used uniformly and at peak efficiency. Moreover, gas networks are frequently also used as buffers. The most important criterion for monitoring the gas grids is the current line pressure. In the past, this required additional devices to perform measurements in the gas flow upstream of the regulator of a gas measurement system. The new EK280 volume conversion device now makes it possible to use a second pressure sensor for this task – in addition to measurement and conversion. Thus the measured value can be recorded and the line pressure can be monitored to ensure that it lies within the set limits.

Fig. 6: Volume conversion and system monitoring with a single device

Up to five additional digital inputs can be used to record and monitor signal sensors such as safety shut-off valves on regulators, differential pressure switches on filters or a simple door contact.

The fact that these measurement data and status information can be sent to a remote system or SCADA system by a separate interface is yet another indication of how versatile and effective the new volume conversion device is. Elster provides volume conversion and system monitoring in a single device while keeping the two functions completely independent in terms of their communications technology.

Reliable power supply – battery and/or mains operation
The basic version of the volume conversion device EK280 is battery-powered. Data communication from Zone 1 potentially explosive atmospheres is also possible with batteries. If the device is used in Zone 2 potentially explosive atmospheres or in safe areas, a power supply unit may also be integrated into the device as an option. The batteries remain in the device in this case to provide a backup power

supply to the volume conversion device in the event that the external power supply fails. It is also possible to buffer the data communication using batteries.

New parameterization program: enSuite – a program for all occasions
We have also taken a new direction for the parameterization process. Our new parameterization software is called enSuite and will not only be used for the new volume conversion device EK280 in the future but also for other newly developed electronic gas measuring equipment from Elster. enSuite – a program for all occasions – more details in the next issue of Profiles.

As you can see, the volume conversion device EK280 has a great deal of potential and is well equipped to meet the demands of the future.

And while we're talking about future demands, the device also supports a firmware update on the basis of the WELMEC 7.2 Software Guide. This can be carried out both via the optical interface and by remote data transfer. This means that the device can be kept up to date even after it has been installed.

All in all, a future-proof investment.

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