

# VOLUME CORRECTOR FMVC-111



The best way to predict the future is to create it

## Introduction

The FMVC-111 is designed to convert gas volume in operating conditions to gas volume in standard conditions according to the state equation. For that purpose, it reads pulses from a gas meter, and measures gas temperature and gas pressure. The volume corrector will support PTZ, PT, TZ or T type conversions using algorithms for calculation of compressibility factors according to the standards AGA 8-92DC, AGA NX-19 mod, AGA 8-G1, AGA 8-G2, SGERG-88 or fixed. The mechanical concept of the conversion device is selected to operate as a single channel. Device configuration also enables measuring and monitoring other quantities. The FMVC-111 gas volume corrector is constructed with the latest microprocessor technology which enables measuring of pressure and temperature using analogue transducers. The device provides large capacity of archives and enables flexibly to change the intervals of data recording. As a standard function the device can generate digital pulses proportional to primary and standard volume as calculated. Data storage is secured by using a hardware switch or a programmable password. The FMVC-111 is designed to solve complex solutions using flexible functional modules. It is battery powered with the option of an external power supply. All required actual and calculated values are presented on a back lighted graphical LCD display operated by a 6-button keypad. It is also possible to make basic parameterization through the keypad. Automated meter reading (AMR) by supervisory systems through serial interface RS-232/RS-485 or PSTN/GSM/GPRS/Radio modems is available with extended modem diagnostic features.



## Power supply



Internal lithium battery

The device operates from an internal lithium battery for 6 years in defined operating conditions. It is possible to use pulse outputs during battery power supply. When an operation modes with increased power consumption is required, an external Intrinsically safe power supply can be used.

## Pressure transducer

- Internal or external pressure transducer
- Cable length up to 5 m
- Silicon piezo-resistive sensor
- Connection thread M12 a 1.5
- Accuracy: < 0.25 % from measured value
- Optional 2<sup>nd</sup> pressure transducer



Internal pressure transducer

## Temperature sensor

- PT-1000 probe
- Length 75/120mm, diameter 5.7 mm
- Two wire cable length up to 10m
- Accuracy: < 0.1 % from measured value
- Optional 2<sup>nd</sup> temperature transducer



Temperature sensor, 75mm

## Communications

### COMMS WITH SUPERVISORY SYSTEMS

For data connection with supervisory systems RS-232, RS-485 or infrared optical communication can be used. Communication can be realized through a PSTN, GSM, GPRS or Radio modem. The TCP/IP protocol is supported. The device is equipped with a manufacture communication protocol for programming and standard Modbus®. Other protocols can be implemented on request.

### MODEM COMMS

For diagnostic purposes during modem installation, there is a possibility to indicate diagnostic information. As an option the presence and connection to Public Networks together with info about the strength of the receive level can be indicated.

### COMMS AND TELEMTRY

The device is equipped with functions which are standard for telemetric systems. To the user it enables monitoring / retrieval of set limits and sending alarms to a control centre including diagnostic modem features.

### COMMUNICATION INTERFACE

- RS-232 / RS-485 serial interface
- Optical interface (IEC-1107)

### DIGITAL INPUTS

Four programmable digital inputs for:

- Binary input or Tamper LF input
- Binary input NAMUR
- Encoder (NAMUR, SCR)
- LF input pulse frequency: max. 10Hz
- LF pulses: reed contact or Wiegand
- HF input pulse frequency: max. 5 kHz (external power supply required)
- HF input (NAMUR DIN19234) (external power supply required)

### Compressibility calculations methods

- AGA-8 92DC
- AGA-8 G1
- AGA-8 G2
- AGA-NX -19 mod
- SGERG-88
- Fixed Z/Zn



Terminals

### DIGITAL OUPUTS

Four programmable digital outputs for:

- Analog output via CL-1 module (4-20mA)
- Binary output (alarm)
- Pulse output (primary volume, standard volume, odorisation control, etc.) or programmable pulse 0.1 to 25 sec.

### Data protection

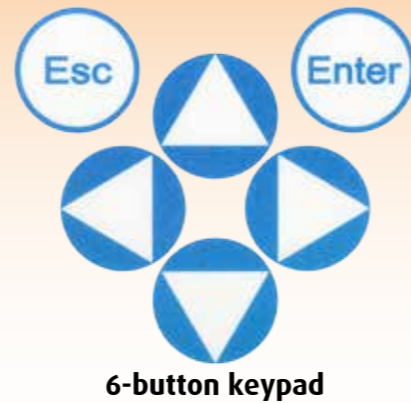
- Password of Switch (inside the device)



Security switch

## Display and keypad

- Operated by 6-button keypad
- Display of measured current values and pre-set parameters
- Possibility to set basic parameters through keypad
- Clear graphical LCD display with backlighting (Backlighting also in battery mode)



## Memory

- Memory type: FLASH, 1MB
- Data archive: 14300 records
- Daily archive: 400 records
- Status archive: over 500 records
- Monthly archive: 25 records
- Audit log: over 400 records

## Software

There are 2 types of parametrization software available:

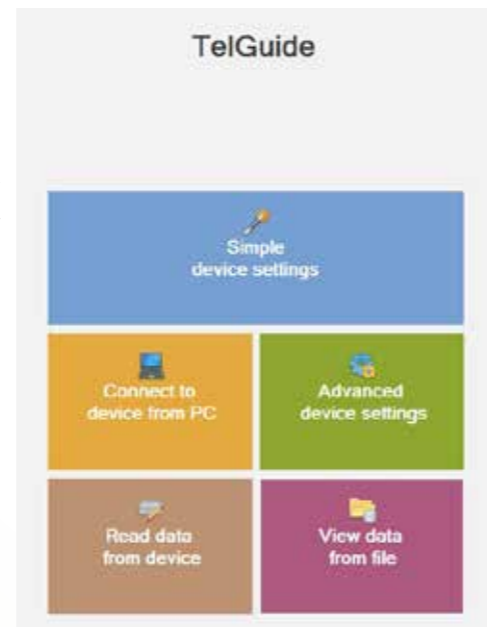
### TelGuide

TelGuide software was developed as a user friendly software to maximally simplify configuration of volume correctors and dataloggers. It has a user friendly interface bringing a step by step guidance to customer. TelGuide allows user to configure all basic parameters in the device, to download archived data and to make a basic diagnostic of the device.

TelGuide is compatible with following products: FMVC-111, nanoDATCOM, miniDATCOM, maxiDATCOM, midiDATCOM, DATCOM-2, DATCOM-RTU, DATCOM-AMR, DATCOM-AMR2, DATCOM-AMR3 and DATCOM-K4.

### TelGuide features:

- easy configuration
- intuitive control
- communication via optical interface (HIE-03/04) or serial interface RS-232/485
- download and viewing of the archived data
- export into the MS EXCEL format
- basic device diagnostics

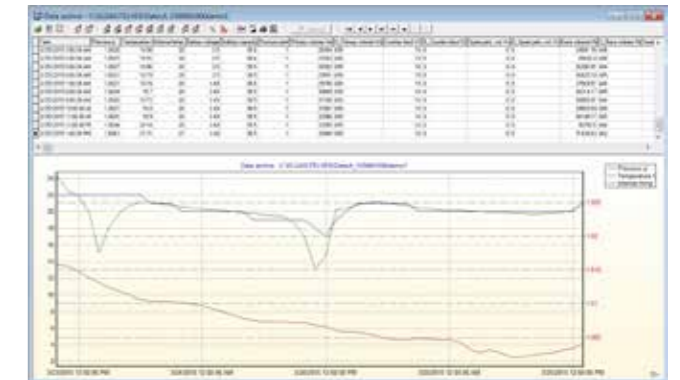


## Telves

Telves software is intended for communication with devices FMVC-111, DATCOM-2, DATCOM-AMR, DATCOM-AMR2, DATCOM-AMR3 and DATCOM-K4.

### Telves features

- communication with system via fixed line RS-232/RS-485, telephone or GSM data modem or GPRS channel
- parametrization of system (FMVC-111, DATCOM-RTU, DATCOM-2, DATCOM-AMR, AMR2, AMR3, DATCOM-K4)
- finishing (calibrating) one-point or two-point measured analogue quantities in modules which enable it
- generating daily and hourly consumption curves in text form with type of quantities "impulse counter"
- reading and displaying momentary values of analogue and binary quantities
- reading archived analogue and binary quantities, its storing into databases
- displaying archived data into table and graph
- securing system with passwords
- reading and setting up system time
- upgrading new firmware in module, which enable it
- periodic automated reading and processing of data from more measuring points at once without user intervention



## Mounting

The FMVC-111 Volume Correctors can be (pre-)installed on Turbine and/or Rotary meters using a set of mounting brackets combined with a pulse cable and a 3-way ball valve to serve periodic EVCD pressure transmitter calibrations.



# Specifications

TECHNICAL SPECIFICATION	
<b>Housing</b>	Polycarbonate
<b>Dimensions</b>	193 x 160 x 73 mm
<b>Weight</b>	1.2 kg
<b>Protection class</b>	IP66 (EN 60529)
<b>Ambient temperature</b>	-25°C to +70°C
<b>Control panel</b>	6 button keypad
<b>Display</b>	Graphical LCD display with backlighting
<b>Power Supply</b>	Lithium battery Operating time > 6 years in defined condition Optional intrinsic safe power supply
<b>Type of battery</b>	SAFT standard lithium battery (D-size, 3.6V/17Ah)
<b>Measuring temperature range</b>	-25°C to +60°C
<b>Measuring pressure ranges (bar abs)</b>	
<b>MID certified</b>	
- Standard ranges	0.8 - 5.2; 2 - 10; 7 - 35; 14 - 70
- Enhanced ranges	0.8 - 10; 4 - 70
<b>Without MID</b>	0.8 - 5.2; 0.8 - 10; 0.8 - 20; 0.8 - 35; 0.8 - 70
<b>Accuracy</b>	<0.5% from measured value (MID)
<b>Communication interface</b>	RS-232 / RS-485 serial interface Optical interface (IEC-1107) PSTN/GSM/GPRS and Radio modem
<b>Communication speed</b>	RS-232 / RS-485: 9.6 to 57.6 kbit/sec Optical interface (IEC-1107): 9.6 to 38.4 kbit/sec
<b>Digital inputs</b>	4 digital inputs (configurable as LF, HF or binary)
<b>Digital outputs</b>	4 digital outputs (configurable as pulse or binary output)
<b>Analogue outputs</b>	up to 4 analogue outputs by using external Current Loop module 4-20 mA
APPROVALS	
<b>Approved according the European metrology standard</b> EN12405-01 and 2004/22/EC (MID)	TCM 143/09-4664
<b>ATEX approved for installation in hazardous area</b> Directive 94/3/EC (EN60079-0, EN60069-11)	FTZU 08 ATEX 324X II 2G Ex ia IIC T4/T3
ACCESSORIES	
<b>Standard delivery</b>	User Manual TRIPPLE - service and data collection software
<b>Optional accessories:</b>	
<b>Installation material</b>	Thermowell, mounting kut, three way tap DIN 3 PN 100
<b>Power supply</b>	Intrinsically safe power supply
<b>Module for current loop</b>	CL-1 (4-20 mA)
<b>Separation and communication module</b>	DATCOM-K3 DATCOM-K4
<b>Digital pressure transducers</b>	Pressure transmitter EDT 23, Temperature transmitter EDT 34
<b>Optical probes</b>	Infrared head HIE-03 (RS-232) Infrared head HIE-04 (USB)
<b>GSM/GPRS communications</b>	DATCOM-AMR1 DATCOM-AMR2 DATCOM-AMR3/E/S
<b>Expansion module for digital transducer</b>	Expansion module RS-485

# Dimensions

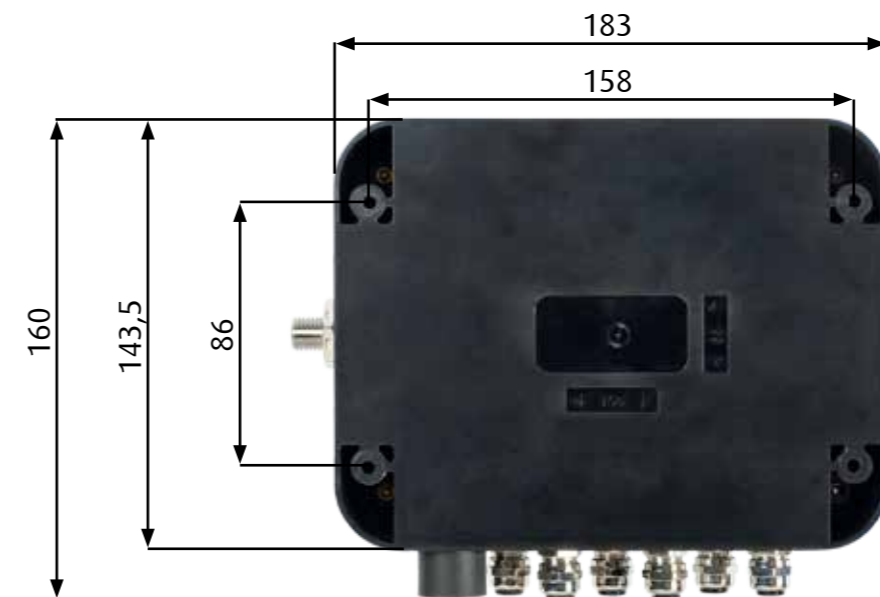
Front



Side



Rear



Bottom



All dimenions are in millimeters

# About us

## FLOW METER GROUP B.V. (FMG)

FMG is an engineering/manufacturing company specializing in the development and production of energy and gas measurement systems. Located in the Netherlands, FMG produces a wide range of rotary and turbine gas meters, volume conversion devices, master meters and calibration benches. Unique product features include self diagnosis and tamper prevention. All products and services are certified by the Dutch NMI and comply with the latest EU and/or OIML directives.

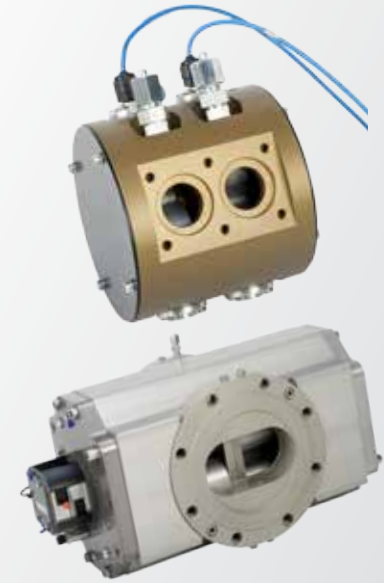
### Flow Meters

FMG offers a large variety of flow meters ranging from very small (100 dm<sup>3</sup>/h) up to very large (40.000 m<sup>3</sup>/h) flow rates and in pressures from atmospheric to 100 bar (1440 psi). All FMG meters comply with international safety and metrological standards. Meters designated for fiscal use are tested, certified and approved by the Netherlands Metrological Institute NMI.

FMG has added extra features to the meters in terms of increased accuracy, protection from manipulation, increased rangeability and superior performance in order to go beyond the minimum requirements of the existing standards.



**Positive Displacement Meters**



**Master Meters**



**Custody Transfer Short Length Turbine Meters**



**Flow Computers**



**Test Benches**

## Contact



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