Generation 4 you

Complete solution for industrial and commercial smart metering

Road milestones

1992 - ELGAS founded

1993 - market presentation of ZOD-4 and ZOD-4P

1994 - world premiere of ELCOR-94, the 1st generation of EVC

1999 - established authorised ELGAS metrological center

2001 - microELCOR launching - the 2nd generation of EVC

2002 - new assembly plant opened in Horní Jelení

2004 - new sales startegy - focus on international markets

2008 - xELCOR series launching – the 3rd generation of EVC

2009 - maxiELCOR - the first EVC with integrated GSM modem

2011 - ELGAS became as Smart metering projects leader

2013 - picoELCOR diaphragm gasmeter with integrated EVC

2014 - GWF aquisition - ELGAS gas meter manufacturer

2018 - ELCOR*plus* launching - the 4th generation of EVC

The company ELGAS, s.r.o. is one of the largest manufacturers of gas volume correctors ranking worldwide in TOP 5. The company was founded in 1992 as Czech private company. Since the beginning ELGAS, s.r.o. was fully involved in development and production of technologies like gas volume correctors, dataloggers, radio communication and AMR systems, dedicated mainly for gas industry.

All company products and solutions are developed by ELGAS, s.r.o. own Research and Development department, having staff of more than 30 HW and SW engineers. The main goal for R&D team is to develop top technology and prepare complete and flexible solution according to the latest specifications and demands of customers.

In 2012 ELGAS, s.r.o. management decided to extend business activities presenting ELGAS, s.r.o. as manufacturer of gas meters as well. Starting with integrated solution based on diaphragm gas meter, ELGAS, s.r.o. continues with development and production of rotary and turbine gasmeters for commercial and industrial customers. It enables to cover all worldwide market demands from gas volume correctors and gas meters up to integrated and hybrid solutions.

All three production plants are certified with quality management system ISO 9001 to ensure top quality products with high accuracy and high reliability. Equally the production is organized to fully comply with all strict requirements and standards necessary for devices installed in hazardous area (ATEX and IECEx).

To achieve the highest accuracy and quality, the production line is equipped with the latest technology such as temperature chambers, cyclic tests chambers, calibration gauges and the other facilities. All steps in manufacturing are controlled and recorded by automatic system enabling to trace back the history of all products. Each product is carefully tested in quality management department with use of all available information from production cycle. It's important not only for better understanding of products behaviour, but also for quality management and as a feedback for research and development team.

The most of ELGAS, s.r.o. products as gas volume correctors and gas meters are dedicated for custody transfer which means that metrological verification and final certificate are mandatory. Authorized metrological center, accredited according to Czech metrological law, was established for such purposes in ELGAS, s.r.o. in year 1994. Since the beginning more than 250.000 units have been successfully tested and verified, most of them under MID rules with module B and D.

ELGAS, s.r.o. operates with wide network of business partners. More than 45 business partners distribute ELGAS, s.r.o. products and solutions in almost 60 countries. They are helping to support main ELGAS, s.r.o. goal to create long-term partnership with all end users bringing them successful, powerfull and reliable solution.

Gas volume corrector ELCOR*plus*

- Single or dual channel EVC
- Modem 2G, 3G, 4G, NB embedded
- ATEX approved ZONE 0, 1, 2
- Modular and scalable design
- Telemetry features
- Datalogger version
- Up to 6 digital transducers

Radial turbine gasmeter TRZ, EQZ, EQZK

- Sizes DN 40-100 G16-400
- Accuracy 1%(TRZ), 1.5%(EQZ/K)
- Self lubricated longlife bearings
- Designed for easy replacement
- Optional over-run brake
- Measuring range 1:10, 1:20

Gas volume corrector ELCOR

- Single channel EVC
- Modem 2G, 3G, 4G, NB embedded
- ATEX approved ZONE 0, 1, 2
- Battery power supply only
- Compact design
- IP66

Rotary gas meter EMR series

- Sizes DN 40-150 G 6-650 PN 16-100/ANSI 150-600
- Measuring range 1:100 (optional 1:160)
- Accuracy 1%
- Compliant with MID or OIML
- Robust and reliable design
- Aluminum body for PN16/ANSI150

Diaphragm gas meter picoELCOR

- Available in sizes G10, G16, G25
- Electronic index
- Full PTZ volume correction
- Modem 2G, 3G, 4G, NB embedded
- Up to 15 years battery life
- High accuracy
- Hazardous area Type approval ATEX (ZONE 1)
- Metrological Type approval MID
- Pulse output

Axial turbine gas meter EMT series

- EMT-Lx DN 50-300 G 65-6500 PN 16-100/ANSI 150-600
- EMT-S DN 80-200 G 100-1600 PN 16-100/ANSI 150-600
- Accuracy 1%
- Compliant with MID or OIML
- Removable cartridge
- Light aluminum bodies up to DN 200

Generation 4you

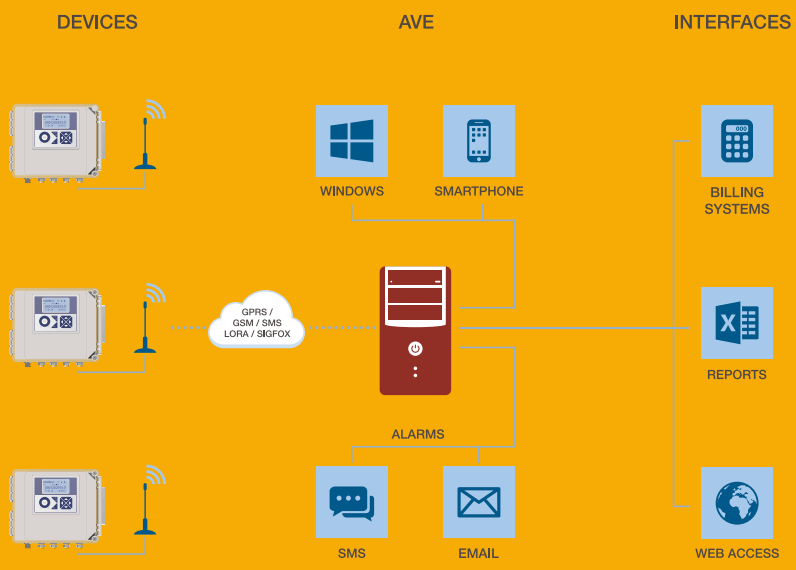
Accessories

PS-M - intrinsically safe power supply module for embedded modem
PS-E - intrinsically safe power supply module for EVC part
B-RS - safety barrier for serial communication RS232/RS485
B-DO - safety barrier for digital outputs
B-DI - safety barrier for digital inputs
B-IB - safety barrier for internal bus RS485
CLO - module of current loop output 4 -20 mA
SRM - solar regulator module

Service and configuration software

- User friendly windows based software
- Advanced configuration
- Guided parametrization
- Local language
- Database file system
- Reading of actual and archived data
- Data processing and visualisation
- Data export

Complete solution - billing and site monitoring



- More than 15 years in business
- Detailed monitoring of energy consumption
- Tens of thousands of remote transfers
- Easy extensibility and scalability
- Energy-reading cost reduction
- Leak and theft detection
- Outstanding technical support
- Optional integration with GIS and SCADA systems
- Bidirectional communication with CRM/billing systems
- Sending alarms via text and email messages
- Meets security audit requirements
- Desktop, Web and smartphones applications

Gas volume correctors

ELCOR and ELCOR*plus*

Highlights

- High accuracy and stability of measurement
- Embedded modem 2G/3G/4G/NB
- Robust design
- Modular technology
- MID and ATEX approved
- Long battery life
- Designed for the future upgrades
- Tamper proof

...get the best from ELGAS longtime experience

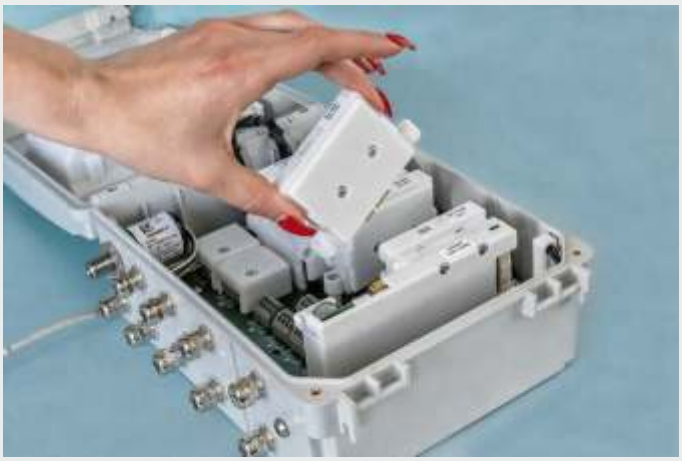
Introduction

The latest Elgas technology ELCOR*plus* and ELCOR represent powerfull solution applicable either like electronic volume corrector for billing purposes or like universal datalogger for station control and monitoring.

Both models are designed as compact devices integrating measuring metrological part together with communication unit and with telemetry features as well.

ELCOR*plus*

The most powerfull model is ELCOR*plus*. Its robust design together with tremendous modularity covers all known demands of gas segment over EVC (ELCOR*plus*) and datalogger installation (DATCOM*plus*).
Battery powered ELCOR*plus* converts gas volume under operating conditions to gas volume at base conditions, according to state equation. Information about primary volume can be received from all types of gasmeters through LF pulses (reed contact or wiegand sensor), HF pulses and absolute encoders (NAMUR, SCR+). The meter can be connected through mechanical index with Elgas relative encoder. EVC calculates the conversion factor C based on actual value of gas pressure, gas temperature and based on compressibility factor according to all known methods.
Lifetime of the EVC battery is up to 18 years in defined conditions and the design also allows to use encoders (NAMUR, SCR+) with battery power supply. The battery life is up to 9 years in such case.
The basic concept enables to use device either as a single or dual channel EVC with possibility to add non-metrological channel. Modular architecture enables to create various configurations up to 6 pressure or temperature transducers, 10 digital inputs, 4 digital outputs, 6 analogue inputs and 4 analogue outputs, based on customer requirements.



Any configuration can be individually customised by parameter file locally or remotely.
All data (instantaneous, archived data, diagnostics) can be visible on backlit graphical LCD display with using 6-buttons keypad. This keypad and LCD combination enables simple parameters setup as well.
All measured and calculated data can be optionally stored at 11 different archieves with sufficient memory capacity covering couple of years without overwriting of old records.

Generation 4you

In addition to metrological measuring part ELCOR*plus* can handle two independent communication modems, internal and external. There are selectable modem modules for 2G, 3G, 4G and 4G NB. Modular design is suitable for easy replacement with future generation of modems without interruption of functioning. All versions even with internal modem are approved for installation in hazardous areas Ex Zone 0, 1, 2.

Lifetime of modem battery with regular calling once a day is guaranteed at least 11 years in defined mode of working. For more frequent communication (or permanent) the external power supply module (AC or solar) can be applied for powering EVC and modem separately.

Except modems there are paralelly usable two selectable serial interfaces RS232 and RS485 and local infrared interface.

The data can be transferred independently to data collection system (billing) or monitoring and control system (Scada). Various communication protocols are available. The protocol can be selected by enduser for each communication channel independently. The data transfer is equipped with access protection, encryption tools and system of firmware remote download.

ELCOR*plus* is designed in robust polycarbonate housing suitable for indoor or outdoor installation. This cabinet is fully resistant against external tampering and disturbances with massive locking lever.

ELCOR

ELCOR is simplified version of bigger ELCOR*plus*. The versatility is limited comparing the bigger model. It is designed as single channel EVC with only one RS485 (or RS232) serial port and with optional embedded modem both powered by batteries. ELCOR is suitable for standard projects where reliable and smart EVC is required.

Datalogger DATCOM and DATCOM*plus*

For telemetry projects where dataloggers are required DATCOM and DATCOM*plus* are available. They use identical HW and FW features as EVC series enhanced with functionality typical for dataloggers installations.

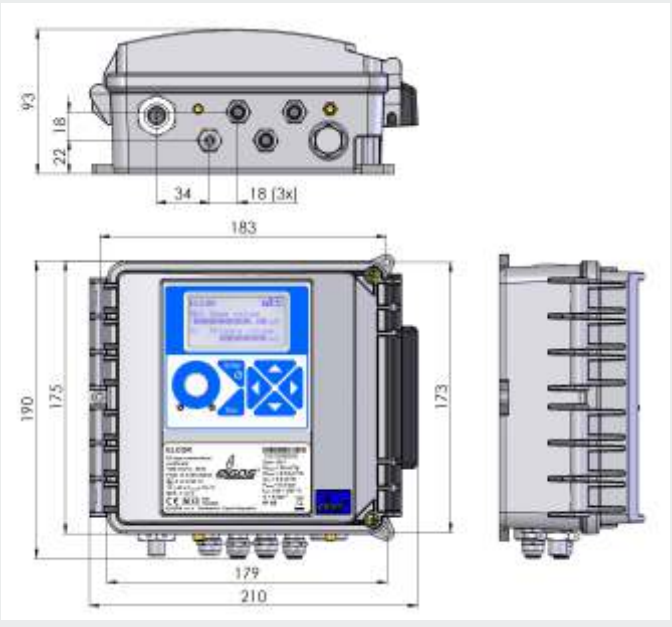
Advantages of open architecture together with flexible internal structure of ELGAS dataloggers series brings unlimited solution for any project in gas segment.

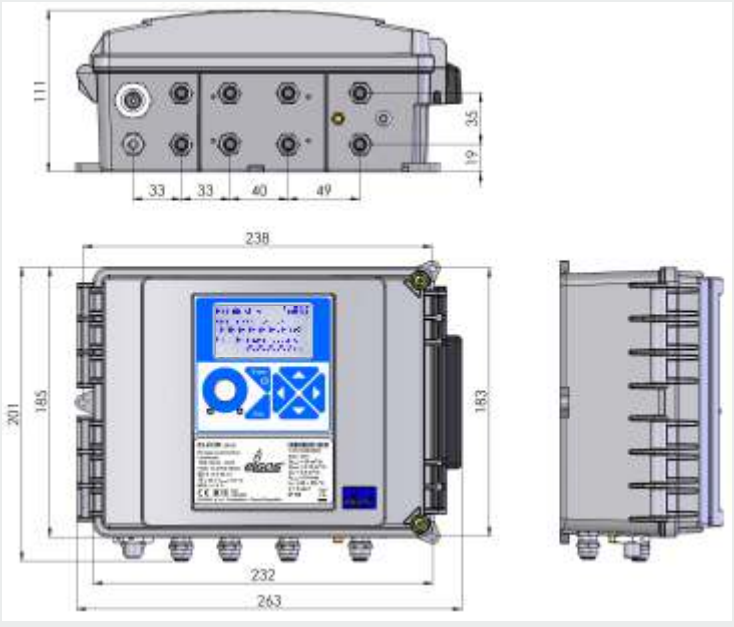
Technical specifications

	ELCOR	ELCOR*plus*
Housing	**The housing was designed for use in outdoor with focus on robustness and resistance against tampering. It can be sealed and secured by a suitable lock. The housing is equipped with a closing mechanism keeping the lid closed tightly even without securing the lid by screws.**	
Material	Glass fiber polycarbonate	
Dimensions	210 x 190 x 93 mm	263 x 201 x 111 mm
Weight (depends on configuration)	1.5 kg	2.2 kg
Protection class	IP66, outdoor environment	
Working temperature	-25°C to +70°C (optionally from -40°C)	
Control panel	**The new ELCOR series brings even better capacitive keypad very well known from picoELCOR series.**	
	6 button capacitive keypad	
Display	**Local reading of all measured instantaneous and archived data.**	
Standard variant	Graphic backlit LCD 128 x 64	
Optional	Alphanumeric segment backlit LCD (working from -40 °C; always ON)	
Digital transducers	**The new generation of digital transducers brings traditional high stability and accuracy of ELGAS pressure and temperature transducers.**	
	Up to 2 digital transducers	Up to 6 digital transducers
Pressure transducer type	EDT 96 (MODBUS-RTU protocol, RS485 interface)	
Standard MID approved ranges - absolute (accuracy 0.25% of measured value)	0.8 - 5.2; 2 - 10; 4 - 20; 7 - 35; 14 - 70; 25 - 130 bar	
Extended MID approved ranges - absolute (accuracy 0.25% of measured value)	0.8 - 10; 0.8 - 20; 4 - 70 bar	
Non MID ranges - absolute (accuracy 0.2% full scale)	0.8 - 35; 0.8 - 70; 0.8 - 130 bar	
Non MID ranges - gauge (accuracy 0.4% full scale - below 1 bar) (accuracy 0.2% full scale - above 1 bar)	0 - 0.2; 0 - 1; 0 - 1.6; 0 - 4; 0 - 6; 0 - 10; 0 - 25; 0 - 40; 0 - 70 bar	
Temperature transducer type	EDT 101 (MODBUS-RTU protocol, RS485 interface)	
Measuring range standard	-25°C to +70°C	
Measuring range extended	-40°C to +70°C	
Power supply	**The device is designed as battery power supplied (ELCOR) with an option of external power supply either from solar pannel or from mains 120V/230V AC (using external modules placed in non-hazardous area).**	
EVC battery packs - battery life (in defined conditions)	B-03 (17Ah) lithium battery - up to 11 years	B-03 (17Ah) lithium battery - up to 11 years B-03D (30Ah) lithium battery - up to 18 years B-03A alkaline battery - up to 6 years
- with NAMUR interface encoder - with SCR+ interface encoder	- not supported - up to 5 years	- up to 5 years (B-03D) - up to 9 years (B-03D)
Modem battery packs - battery life (in defined conditions)	HB-03 (GSM/GPRS modem, lithium battery, 12Ah) - up to 6 years HB-03D (GSM/GPRS modem, lithium battery, 20Ah) - up to 11 years HB-04 (LTE modem, lithium battery, 12Ah) - up to 6 years	
External power supply	not available	PS-E external module (EVC) PS-M external module (MODEM)
Communication with the device	**Both models supports various communication interfaces allowing local or remote communication.**	
Serial communication interface	1x RS232 or RS485	2x RS232 or RS485
Optical communication interface	optical interface (EN 62056-21)	
Wireless communication (modem)	GSM/GPRS LTE Cat1 LTE M1 LTE-NB (preliminary)	

Technical specifications

		ELCOR	ELCOR*plus*
Inputs/Outputs		**The device provides digital inputs and outputs fully configurable by end user.**	
Digital inputs		3x (LF or binary)	up to 10x (LF, HF, binary)
Digital outputs		2x (LF or binary)	4x (LF or binary)
Analog inputs (4-20mA)		not available	up to 6x (optional)
Analog outputs (4-20mA)		2x (using external module CLO)	up to 4x integrated (optional) up to 4x (using external module CLO)
Encoder interface		**Various encoders are supported**	
Encoder types supported		NAMUR SCR+ ELGAS	
Extension internal modules		**ELCOR and ELCORplus series was developed as modular device enabling full customization.**	
Communication	**Modem**	M2G: 2G modem M4G: 2G/3G/4G - LTE Cat1 modem M4GM1: LTE M1 modem LTE-NB (preliminary)	
	Serial interface	integrated	S1-COM: RS232/RS485 serial interface
Gas meter encoder interface		S0-SCR: SCR+ encoder interface S0-NAM: NAMUR encoder interface	
Analog 4 - 20mA input/output	**Inputs**	not available	S1-2AI: 2x input
	Outputs	not available (externally via CLO module)	S1-2AO: 2x output
External power supply	**EVC**	not available	S3-PWR1
	Modem		S4-PWR2
Multipurpose extension board		not available	S0-EXT1: 2x HF NAMUR input 6x LF/Binary digital input 2x Analog input (4 - 20 mA) 2x digital transducer EDT





picoELCOR

picoELCOR is ELGAS series of SMART diaphragm gas meters integrating the electronic index, volume conversion, datalogger and GSM/GPRS/SMS modem with ELSTER or APATOR METRIX mechanical diaphragm gas meter body.
Solid mechanical design, proven technology and use of the latest low power microprocessor technology with high processing power brings to customer guarantee of smooth functioning and space for future software and hardware extensions.
The volume measurement principle is based on measuring of gas flowing through mechanical units. Each unit has four measuring chambers, separated by synthetic diaphragms. The mechanical movement is transfered via gears to a crankshaft moving the valves.

Diaphragm gas meter with electronic index and integrated EVC

picoELCOR

Highlights

- All-in-one solution
- Integrated PTZ volume conversion
- High accuracy and stability of measurement
- Embedded 2G modem
- MID and ATEX approved
- Designed for hazardous area ZONE 1
- Pulse output
- Long battery life
- Sizes G10, G16, G25

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Rotating movement is scanned by tamper proof optical element. This optical element ensures maximum protection against an external magnetic fields helping to eliminate tampering of the meter.
The base volume is calculated on the basis of precise measurement of the pressure, temperature and using conversion formula. Pressure and temperature transducers are integrated into the gas meter body.
The electronic index with LCD display, controlled by two button keypad (accessible after opening of the front cover) gives the information about measured volume and offers user friendly interface to the customer for reading of data. The integrated battery powered GSM/GPRS/SMS modem transfers the collected data via cellular network.
Power supply is realized by two separate lithium batteries (EVC battery and modem battery) enabling to power the device for up to 15 years (metrological part).

Technical specifications

General

Protection class	IP 65 (EN60529)
Working temperature	-25°C to +55°C
Control panel	2 button keypad shielded by the front cover
Display	Alphanumeric multisegment LCD with icons
Measuring temperature range	-25°C to +55°C
Measuring pressure range	0.8 -1.6 bar (absolute)
Total accuracy (MPE)	1.5 %
Communication interface	optical interface (IEC 62056-21) GSM/GPRS modem
Digital outputs	1 digital output - pulse or analog output (CL-1 module is required for the analog output)
Battery power supply (metrology)	B-02 lithium battery, 3.6V, battery life >15 years in defined conditions
Battery power supply (modem)	HB-02 lithium battery, 3.6V, battery life >5 years in defined conditions
Metrological type approval MID 2014/32/EU, EN 1359, EN 12405-01	TCM 143/13 - 5018
ATEX approval 2014/34/EU **Classification** (EN 60079-0, EN 60079-11, EN 13463-1, EN 13463-5)	FTZÚ 13 ATEX 0024X Ex II -/2 G IIA T3, ZONE 1

Flow rates

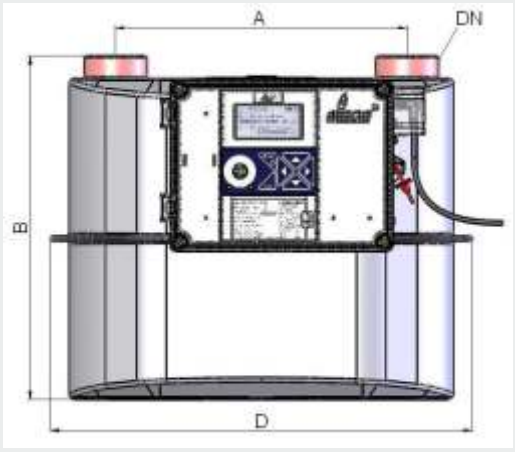
	Qmin [m^3/h]	Qmax [m^3/h]	V [dm^3]
	operating conditions = base conditions		
picoELCOR v.2 (v.3) G10	0.1	16	6 (5.6)
picoELCOR v.2 (v.3) G16	0.16	25	6 (5.6)
picoELCOR v.2 (v.3) G25	0.25	40	12 (11.2)

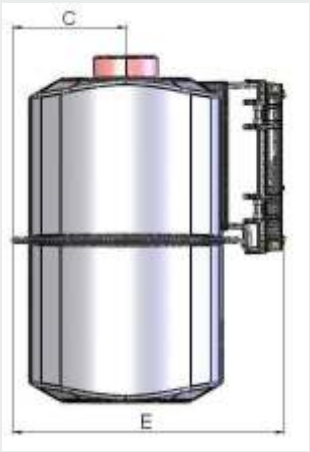
Dimensions and weight

	Dimensions [mm]					Weight [kg]
	A	B	C	D	E	
picoELCOR v.2 (v.3) G10	250	320 (349)	85 (94)	334 (398)	243 (250)	5.3 (7.5)
	280	330 (349)	108 (94)	405 (398)	259 (250)	6.9 (7.5)
picoELCOR v.2 (v.3) G16	280	330 (349)	108 (94)	405 (398)	259 (250)	6.9 (7.5)
picoELCOR v.2 (v.3) G25	335	398	138	465	313	11.2

Connection

	DN	Thread
picoELCOR v.2 (v.3) G10	25	1 1/4¨
	32	1 3/4¨
picoELCOR v.2 (v.3) G16	40	2¨
picoELCOR v.2 (v.3) G25	50	2 1/2¨





...get the best from ELGAS longtime experience

Radial-blade turbine gas meters

TRZ, EQZ, EQZK

Highlights

- Sizes DN (40) 50-100 G 16-400 PN 4
- Accuracy 1% (TRZ), 1.5% (EQZ/K)
- Self lubricated longlife bearings
- Designed for easy replacement
- Optional over-run brake

...concept with advantages

ELGAS radial-blade turbine meter is a velocity meter designed for industrial and commercial use.

Radial-blade turbine gas meter

- Meter sizes G/Q 16 up to 400
- Measuring range of 3 up to 650 m3/h
- There is a solution for each demand

Over-run brake (optional)

- Suppression of after-run error at intermittent operation without restriction of the measuring range
- For TRZ DN 50–100 and EQZ DN 40–100

Monopipe adaptor EAS

- Component of the pipeline
- Flange connection DN 50 – DN 100
- Thread connection G 11 ” and G 2”
- The monopipe adaptor can be installed into the pipeline in advance with an over flow cap or lid cap

Installation and maintenance

- Can be installed in any position from horizontal to vertical
- Simple exchange of the meters on site. The heavyweight monopipe adaptor remains in the pipeline
- The disconnection of the meter and monopipe adaptor allows a tension-free meter installation

Why an over-run brake?

Axial-blade turbine or radial-blade turbine gas meters are most often used for measuring consumption of heating gas supply systems. All turbine meters of this construction are based on the principle of velocity measurement. The advantages of the radial blade turbine gas meter are mainly to be found in its simple installation, small size, light weight, in any installation arrangement and low cost. However gas meters with the velocity measuring principle are not ideal for intermittent operation. When an energy consuming installation is suddenly switched off, the meter does not react immediately. The freely moving turbine wheel continues to rotate at a slowly decreasing speed andwill produce an error. In such case this error can be eliminated by installation of over-run brake.

Radial-blade turbine gas meter head

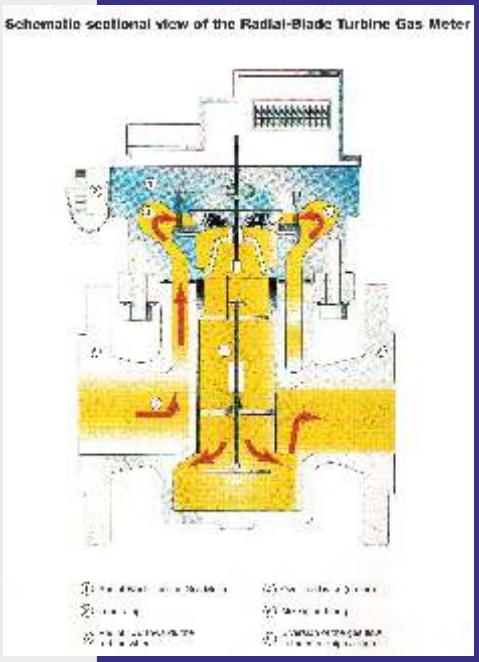
Over-run brake (optional)

Monopipe adaptor EAS

Radial-blade turbine gas meter TRZ

Technical characteristics

- Principle of velocity measurement
- For measurements requiring obligatory verification (for MID versions)
- Accuracy:
  - from 0.2Q_{max} to Q_{max} ... +/-1 %
  - below 0.2Q_{max} ... +/- 2 %
- Sizes G 16 up to G 400
- Dimensions DN 50, 80 and 100
- Different G-sizes per nominal width:
  - DN 50: G 16 up to G 100
  - DN 80: G 65 up to G 250
  - DN 100: G 160 up to G 400
- Operating pressure max. 6 bar
- Measuring head can be calibrated without monopipe fitting
- The counter is in a gas-free space
- High measurement stability and operational security due to high-quality, wear-resistant components
- Self-lubricating ball bearings
- Pressure extraction connection inside the meter
- Designed for simple servicing (measurement-cartridge principle)
- LF-pulse generator (in standard)
- Integrated flow strainer
- Short straight inlet lengths (2 x DN)
- Operation temperature range:
  - gas temperature from -10°C up to +60°C (+55°C)
  - ambient temperature from -10°C up to +60°C



Options

- Over-run brake: Mechanical over-run brake without measuring range for intermitting operation
- Pulse generators:
  2nd LF-REED, it can be retrofitted without breaking the verification seal
  - MF-NAMUR
  - HF-NAMUR
- Temperature sensor pockets in monopipe fitting

Standards and approvals

- International/national type approval MID TCM 143/13-5110
- EC registration cerfticate

Mounting and maintenance

- Mounting/dismounting of the measuring head is possible without disconnecting the monopipe fitting
- The monopipe fitting remaining in the pipe network enables mounting/dismounting of the meter element without tension from the pipe network
- It can be installed in any position from horizontal to vertical (turbine axis not suspended and roller counter axis always horizontal)

Generation 4you

Radial-blade turbine gas meter EQZ and EQZK

Technical characteristics

- Principle of velocity measurement
- For measurements not requiring obligatory verification
- Accuracy:
  - from 0.2Q to Q ... +/-1.5 % max max
  - below 0.2Q ... +/- 2 % max
- Sizes Q 16 up to Q 400
- Dimensions DN 40, 50, 80 and 100
- Different Q-sizes per nominal width:
  - DN 40: Q 16 up to Q 65
  - DN 50: Q 16 up to Q 100
  - DN 80: Q 65 up to Q 250
  - DN 100: Q 160 up to Q 400
- Operating pressure max. 6 bar
- Measuring head can be calibrated without monopipe fitting
- Pressure extraction connection inside the meter
- High measurement stability and operational security due to high quality, wear-resistant components
- Self-lubricating ball bearings
- Operating pressure max. 6 bar
- Counter is in a gas-free space
- Designed for simple servicing (measurement-cartridge principle)
- Standard integrated flow strainer
- Short straight inlet lengths (2 × DN)
- Operation temperature range:
  - gas temperature -10°C up to +60°C
  - ambient temperature -10°C up to +60°C

Options

- Over-run brake:
  Mechanical over-run brake without measuring range for intermitting operation (only for EQZ)
- Pulse generators:
  - LF-REED
  - 2nd LF-REED, it can be retrofitted without breaking the verification seal
  - MF-NAMUR
  - HF-NAMUR (only for EQZ)
- Temperature sensor pockets in monopipe fitting

Mounting and maintenance

- Mounting/dismounting of the measuring head possible without disconnecting the monopipe fitting
- The monopipe fitting remaining in the pipe network enables mounting/dismounting of the measuring head without tension from the pipe network
- It can be installed in any position from horizontal to vertical (turbine axis not suspended and roller counter axis always horizontal)

Standards and approvals

- Developed and produced according to Quality Standard ISO 9001:2008
- EC registration certicate CE 0085

EQZK - special features

- Special version for measuring of sewer gas and biogas (without verification)
- Internal surface protected against corrosion with PTFE (Teflon).
- Wear-resistant ceramic ball bearings
- Calibration without fitting disassembly
- All components of have a surface treatment for passive corrosion protection
- Limited warranty of durability due to the chemical factors as:
  - hydrogen sulphide
  - amonia
  - humidity
  - dirt
- The sewer gas meter EQZK may not be used upstream the gas-storage unit
- The gas should be filtered before it flows to the meter
- The meter should not be installed at the lowest point of an installation in order to avoid any accumulation of condensate inside the meter
- In case of strong condensation a condensate drain should be provided upstream and downstream the meter

Technical specifications

Radial-blade turbine gas meter TRZ

		Load range		Max. operating pressure	Pulse generators			
DN [mm]	G-value	Q_{min} [m^3/h]	Q_{max} [m^3/h]	P [bar]	LF (standard) 1 pulse = m^3	2nd LF (option) 1 pulse = m^3	MF (option) 1 pulse = m^3	HF (option) approx. f at Q_{max} [Hz]
50	G 16	5	25	6	1	1	0.01	350
50	G 25	4	40	6	1	1	0.01	650
50	G 40	6	65	6	1	1	0.01	850
50	G 65*	5	100	6	1	1	0.01	1300
50	G 100*	8	160	6	1	1	0.01	1300
80	G 65	10	100	6	1	1	0.01	200
80	G 100	16	160	6	1	1	0.01	320
80	G 160*	13	250	6	1	1	0.01	500
80	G 250*	13	400	6	1	1	0.01	800
100	G 160*	13	250	6	1	1	0.01	440
100	G 250*	20	400	6	1	1	0.01	380
100	G 400*	20	650	6	1	1	0.01	610

* Available in MID version with obligatory verification.

Radial-blade turbine gas meter EQZ and EQZK

		Load range		Max. operating pressure	Pulse generators			
DN [mm]	G-value	Q_{min} [m^3/h]	Q_{max} [m^3/h]	P [bar]	LF (option) 1 pulse = m^3	2nd LF (option) 1 pulse = m^3	MF (option) 1 pulse = m^3	HF (EQZ only) (option) approx. f at Q_{max} [Hz]
40/50	G 16	3	25	6	1	1	0.01	350
40/50	G 25	4	40	6	1	1	0.01	550
40/50	G 40	5	65	6	1	1	0.01	850
40/50	G 65	6	100	6	1	1	0.01	1300
40/50	G 100	10	160	6	1	1	0.01	1300
80	G 65	10	100	6	1	1	0.01	200
80	G 100	12	160	6	1	1	0.01	320
80	G 160	15	250	6	1	1	0.01	500
80	G 250	20	400	6	1	1	0.01	800
100	G 100	13	160	6	1	1	0.01	280
100	G 160	15	250	6	1	1	0.01	440
100	G 250	20	400	6	1	1	0.01	380
100	G 400	25	650	6	1	1	0.01	610

Axial turbine gas meters

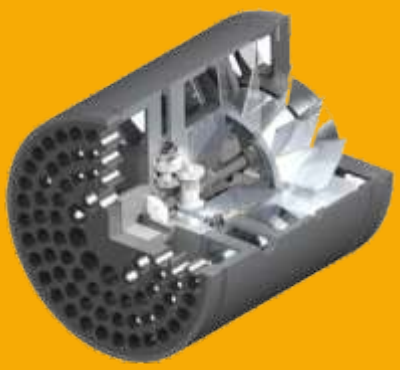
EMT-Lx and EMT-Sx series

Highlights

- EMT-Lx DN 50-300 G 65-6500 PN 16-100/ANSI 150-600
- EMT-S DN 80-200 G 100-1600 PN 16-100/ANSI 150-600
- Accuracy 1%
- Compliant with MID or OIML
- Removable cartridge
- Light aluminum bodies till DN 200

Introduction

The EMT-Lx series turbine meters are robust meters, designed to perform on the highest level of accuracy. The EMT-S turbine meters have similar features as EMT-Lx series, with its unique design of smallest possible installation length. The meters comply with all international standards and are approved for custody transfer. The actual flow sensor, an exchangeable cartridge, has a build-in multi stage flow conditioner enabling the meter to be installed without any straight in- and outlet sections in the case of EMT-Lx, or 1x DN in the case of EMT-S. All tested and proved according perturbation test as per international standards.



The cartridge can be pre-calibrated, under both low and high pressure conditions, and then exchanged on-site. The cartridge is supported in O-rings and isolated from the body, hence unaffected by any influences of the housing. The short length cartridge enables the use of larger sized cartridges than the size of the meter body. The approved maximum capacities of this kind of meters are extremely high and similar to the capacities of ultrasonic meters.

To reduce transportation cost, optimize the corrosion protection and improve safety in handling, the EMT-Lx series of turbine meters up to 6" (DN150) and complete EMT-S series are also available with low weight aluminum meter bodies.

Applications

The standard turbine meters are suitable for custody transfer gas measurement of all non-corrosive gases such as natural gas, propane, butane, air, nitrogen, hydrogen, etc. for low and high operating pressures. Special constructions can be supplied for use under extreme condition like high temperatures or corrosive gases. The EMT-Lx can be modified to perform as a master meter or transfer master meter.

For flange ratings up to ANSI300 and PN40, the body is available in aluminium (steel on request). Due to the extremely low weight of these aluminium bodies, the meter can be transported easily and exchanged without special equipment.

Standard EMT-S bodies up to 8” (DN 200 mm) ANSI150 or PN10/PN16 come with flanges. Larger sizes or higher pressure ratings up to 24” ANSI600 are available in steel.

Main features

- Flow range of EMT-Lx: 3 - 10 000 m^3/h,
  for EMT-S: 3- 2 500 m^3/h
- Diameters of EMT-Lx: DN 50 – DN 300 (2” - 12”),
  EMT-S: DN 80-DN 200 (3” - 8”)
- Pressure rates PN 10 - 100, ANSI 150 – 600¨
- Accuracy:
  0,2 Qmax to Qmax: ± 1% or better
  Qmin to 0,2 Qmax: ± 2% or better
- Repeatability: better than 0,1%
- Mounting position: Horizontally or vertically
- Compliant with: EN12261:2002
  EN12261:A1-2006
  OIML R137 1&2 (2014)
  MID 2014/32/EU
- Temperature Range:
  ATEX: -25°C to +70°C
  MID: -25°C to +70°C (lower temperatures on request)
  PED: -20°C to +70°C (lower temperatures on request)
- Length 3x DN for EMT-Lx,
  short length 1x DN for EMT-S
- Removable meter cartridge
- No straight inlet/outlet sections required for EMT-Lx,
  1 x DN straight inlet section required for EMT-S
- Oil flushing and lubrication system
- Multipurpose exchangeable index
- Tamper proof IP67 sealed index
- Seals according EN 549 (seals for gas appliances and gas equipment)
- ATEX approvals:
  Sensors compliant with Ex ia IIC T4...T6 Gb
  (-40°C ≤Ta +70°C)
  Encoder compliant with Ex ib IIB T3... T6 Gb
  (-25°C ≤Ta +55°C)
- Body: Compliant to Pressure Equipment Directive 2014/68/EU

Index

The basic index consists of an UV-resistant polycarbonate cover, glued (IP67) to an aluminum frame. The aluminum frame will give strength to the index and as such sufficient protection against mechanical interference (Tampering).
The index can be rotated over 350° to all directions. The index can be equipped with multiple LF switches (Reed or Wiegand principle), “Normally Closed” tamper contacts and encoder technology. The LF pulsers and its driving magnet are shielded to overcome tampering with an externally applied magnetic field. Magnetic fields up to 500 mT will not have an effect on the pulse counting. The index or instrument drive can be equipped with several options making the meter prepared for the future:

Wiegand pulsers:
The Index can be equipped with multiple Wiegand pulsers. The Wiegand pulsers do have significant advantages over the traditionally used Reed contacts. Wiegand sensors do not face “bouncing” problems and the actual live time is not limited as much as the traditional Reed contacts.

Intelligent index/encoder:
The index can be equipped with an intelligent encoder. The encoder sends out the total volume with an interval of 400 msec. The encoder uses a standard NAMUR serial data format, and can be modified to special applications on request. The encoder is powered by one AA cell battery guaranteed for 12 years of operation. Two AA cells can be installed on request for a guaranteed life time of 20 years. The encoder is equipped with a special Hall sensor to detect and register interferences from external magnets. Several programmable inputs/ outputs are available for advanced – anti fraud – functions.

Heavy duty bearings

Since gas pressure causes the main force on the bearings the both series incorporates bearings dedicated to the working pressure. Turbine meters which have a low working pressure are equipped with lighter bearings then the meters which are used at higher working pressures. This way the best measuring ranges and life times can be guaranteed.

Lubrication

The turbine meters can be equipped with several types of lubrication systems or with lifetime lubrication. ELGAS recommends to use the lubrication system. An integrated splash vane will distribute the oil to all the moving parts and will flush the bearings. The EMT-Lx and EMT-S series incorporates high quality precision bearings. For optimal lifetime guarantees it is recommended they should be lubricated and clean. Recommendations as to when to lubricate turbine meters varies by product type, operating conditions, customer procedures, and regulatory requirements. Meter performance is optimized by flushing contamination from the bearings and refreshing or adding of oil during operation.

High frequency sensors

Turbine meters can be equipped with several types of high frequency sensors.

HF main shaft: this high frequency sensor generates two independent phase shifted signals and as such the flow direction can be monitored. The generated signal complies with NAMUR.

HF turbine wheel: this HF sensor can be used to check the condition of the turbine wheel (missing blades) by comparing the pulses with the HF main shaft.

For both sensors, the electrical separation between the hazardous and non-hazardous areas is accomplished by an intrinsically safe insulation amplifier.

Materials

Body (Standard): Low weight aluminum / steel
Bearings: Stainless steel
Body (Optional): Low temperature steel
Shafts: Stainless steel
Cartridge: Aluminum
Gears: POM
Straightening vane: Aluminum
Index frame: Aluminum
Turbine wheel: Aluminum
Index frame: Polycarbonate ECI
Bearing block: Stainless steel / aluminum

Technical specifications

Axial turbine gas meters EMT-Lx series

Size	G-value	Qmax	Qmin		
DN [mm]	[-]	[m^3/h]	Atm.Air [m^3/h]	4 barNG [m^3/h]	8 barNG [m^3/h]
50	G65	100	10	5	3
	G100	160	8	5	3
	G160	250	13	8	5
	G250*	400	20	13	8
80	G65	100	10	5	3
	G100	160	8	5	3
	G160	250	13	8	5
	G250	400	20	13	8
	G400*	650	32	20	13
100	G65	100	10	5	3
	G100	160	8	5	3
	G160	250	13	8	5
	G250	400	20	13	8
	G400	650	32	20	13
	G650	1000	50	32	20
	G1000	1600	80	50	32
150	G160	250	13	8	5
	G250	400	20	13	8
	G400	650	32	20	13
	G650	1000	50	32	20
	G1000	1600	80	50	32
	G1600	2500	125	80	50
200	G400	650	32	20	13
	G650	1000	50	32	20
	G1000	1600	80	50	32
	G1600	2500	125	80	50
	G2500	4000	125	80	
250	G650	1000	50	32	20
	G1000	1600	50	32	
	G1600	2500	80	50	
	G2500	4000	130	80	
	G4000	6500	200	130	
300	G1000	1600	50	32	
	G1600	2500	80	50	
	G2500	4000	130	80	
	G4000	6500	200	130	
	G6500	10000	320	200	

* Approved but on request
** ?P is measured under atmospheric conditions with natural gas with relative density of 0.6 (air = 1)
*** Values may vary 5% due to machining tolerances

?P [NG]**	LF	HF Main***	HF Wheel***	Dimensions				Weight [kg]			
[Pa]	[imp/m³]	[imp/m³]	[imp/m³]	C [mm]	E [mm]	H [mm]	L [mm]	PN10/16 ANSI150 ALU	PN10/16 ANSI150 STEEL	PN25/40 ANSI300 STEEL	PN64/100 ANSI600 STEEL
900	10	18440	64540	155	As per flange dimension	175	150	8	17	17	17
900	1	22560	67657	155		175	150	8	17	17	17
1600	1	8235	28815	155		175	150	8	17	17	17
1600	1	5180	20705	155		175	150	8	17	17	17
900	10	1845	64540	144		178	240	9	22	24	27
900	1	22560	67675	144		178	240	9	22	24	27
900	1	8235	28815	144		178	240	9	22	24	27
1600	1	5180	20705	144		178	240	9	22	24	27
1600	1	2340	9350	144		178	240	9	22	24	27
900	10	18440	64540	156		190	300	15	34	41	48
900	1	22560	67675	156		190	300	15	34	41	48
900	1	8025	24065	156		190	300	15	34	41	48
900	1	3915	13700	156		190	300	15	34	41	48
900	1	2340	9350	156		190	300	15	34	41	48
1600	1	2950	5165	156		190	300	15	34	41	48
1600	0.1	1435	2865	156		190	300	15	41	-	-
900	1	8025	24065	180		213	450	27	61	79	98
900	1	3915	13700	180		213	450	27	61	79	98
900	1	4475	6715	180		213	450	27	61	79	98
900	1	2950	5165	180		213	450	27	61	79	98
1600	0.1	1435	2865	180		213	450	27	61	79	98
1600	0.1	885	1770	180		213	450	-	73	-	-
900	1	4475	6715	185		243	600	-	75	99	133
900	1	2950	5165	185		243	600	-	75	99	133
900	0.1	1435	2865	185		243	600	-	75	99	133
900	0.1	885	1770	185		243	600	-	75	99	133
900	0.1	440	1310	185		243	600	-	90	-	-
900	1	2950	5165	236		282	750	-	200	236	315
900	0.1	775	2320	236		282	750	-	200	236	315
900	0.1	440	1310	236		282	750	-	200	236	315
900	0.1	440	1310	236		282	750	-	200	236	315
1600	0.1	245	740	236		282	750	-	240	-	-
900	0.1	775	2320	236		283	900	-	240	285	365
900	0.1	440	1320	236		283	900	-	240	285	365
900	0.1	245	740	236		283	900	-	240	285	365
900	0.1	245	740	236		283	900	-	240	285	365
1600	0.1	125	370	236		283	900	-	290	-	-

Technical specifications

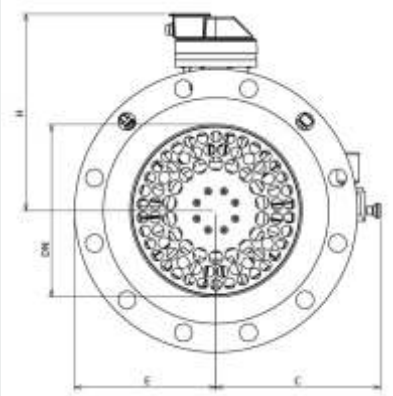
Axial turbine gas meters EMT-Sx series

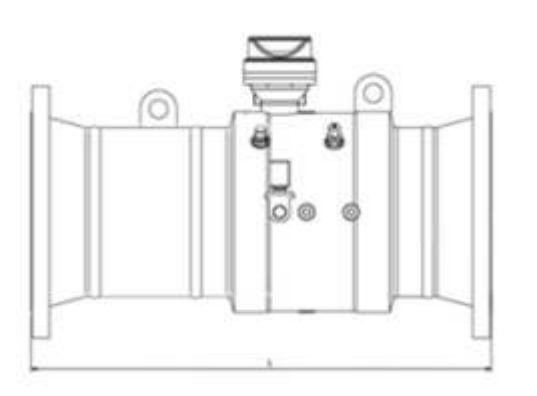
Size	G-value	Qmax	Qmin			?P [NG]*	LF	HF Main**	HF Wheel**
DN [mm]	[-]	[m^3/h]	Atm.Air [m^3/h]	4 barNG [m^3/h]	8 barNG [m^3/h]	[Pa]	[imp/m^3]	[imp/m^3]	[imp/m^3]
80	G100	160	8	5	3	900	10	21845	64540
	G160	250	13	8	5	900	1	22560	67675
	G250	400	20	13	8	900	1	8235	28815
100	G160	250	13	8	5	900	1	8025	24065
	G250	400	20	13	8	900	1	3915	13700
	G400	650	32	20	13	900	1	2340	9350
150	G400	650	32	20	13	900	1	4475	6715
	G650	1000	50	32	20	900	1	2950	5165
	G1000	1600	80	50	32	1600	0.1	1435	2865
200	G650	1000	50	32	20	900	1	2950	5165
	G1000	1600	80	50	32	900	0.1	1435	2865
	G1600	2500	125	80	50	1600	0.1	885	1770

Dimensions

Size	G-value	Dimensions EMT-S (Flanged)								Dimensions EMT-S (Wafer)					
DN [mm]	[-]	C [mm]	E [mm]	H [mm]	L [mm]	ALU [kg] <21bar	STEEL [kg] <21bar	STEEL [kg] <51bar	STEEL [kg] <101bar	C [mm]	E [mm]	H [mm]	L [mm]	ALU [kg]	STEEL [kg]
80	G100	175	95	175	120	8	27	27	27	175	95	178	120	7	13
	G160	175	95	175	120	8	27	27	27	175	95	178	120	7	13
	G250	175	95	175	120	8	27	27	27	175	95	178	120	7	13
100	G160	192	112	185	150	11	47	47	55	192	112	190	150	8	15
	G250	192	112	185	150	11	47	47	55	192	112	190	150	8	15
	G400	192	112	185	150	11	47	47	55	192	112	190	150	8	15
150	G400	212	138	212	175/ 180	19	79	79	102	212	138	213	175/ 180	12	25
	G650	212	138	212	175/ 180	19	79	79	102	212	138	213	175/ 180	12	25
	G1000	212	138	212	175/1 80	19	79	79	102	212	138	213	175/ 180	12	25
200	G650	243	168	238	200	26	86	112	152	243	168	243	200	15	35
	G1000	243	168	238	200	26	86	112	152	243	168	243	200	15	35
	G1600	243	168	238	200	26	86	112	152	243	168	243	200	15	35

* ?P is measured under atmospheric conditions with natural gas with relative density of 0.6 (air = 1)
** Values may vary 5% due to machining tolerances





Rotary gas meters

EMR series

Highlights

- Sizes DN 40-150 G 6-650 PN 16-100/ANSI 150-600
- Measuring range 1:100 (optional 1:160)
- Accuracy 1%
- Compliant with MID or OIML
- Robust and reliable design
- Aluminum body for PN 16/ANSI 150

Introduction

The ELGAS series of rotary gas meters are designed to meet the highest demands of reliable and accurate measurement and OIML R137 1&2 (2014). The compact exchangeable aluminum cartridge allows local repair and on-site cleaning. The robust design of the casing and the cartridge make the meter less sensitive to installation stresses caused by the connecting piping. A significant amount of misalignment of the connecting piping/flanges can be tolerated by the meter without affecting the meter performance by jamming the impellers.

The aluminum casing of the EMR (body and front plate) is designed for working pressures up to 20 barg with a safety factor of 4. The square impellers and the improved position of the main bearings and shafts, make the meter less sensitive to overload and pressure shocks. The aluminum index and the protection of the LF pulsers with the associated magnets, make the meter less sensitive to manipulation by externally applied magnets or other external forces.

Tampering of meters with strong neodymium magnets is one of the major concerns of utility companies, as this kind of manipulation is very difficult to detect or prove. In order to protect the meter, the index can also be equipped with an intelligent encoder.

The unique proprietary oiling system, where the oil is distributed directly to the timing gears by means of a disc, eliminates oil loss at high rotor speeds and will lubricate the timing gears at very low loads. All plugs and oil sight glasses are in the front of the meter, allowing the meter to be installed in very compact installations.

The EMR series of rotary meters is suitable for custody transfer gas measurement of all non-corrosive gases such as natural gas, propane, butane, air, hydrogen, etc. Special constructions can be supplied for use under extreme conditions like higher temperatures and corrosive gases.

Main features

- Flow range 0.5 – 650 m^3/h
- Diameters DN 25 – DN 150 (1” – 6”)
- Pressure rates PN 10 – 100, ANSI 150 – 600
- Accuracy:
  Qt to Qmax: ± 1% or better
  Qmin to Qt: ± 2% or better
- Repeatability: better than 0.1%
- Mounting position: Horizontally or vertically
- Compliant with: EN12480:2002
  EN12480:2015
  OIML R137 1&2 (2014)
  MID 2014/32/EU
- Temperature Range:
  ATEX: -25°C to +70°C
  MID: -25°C to +70°C
  (lower temperatures on request)
  PED: -20°C to +70°C
  (lower temperatures on request)
- Large rangeability
- Removable cartridge design
- Robust construction
- Multi position
- Square impeller technique
- Compact installation
- Easy local repair
- On-site cleaning
- Tamper proof exchangeable index
- Seals according EN 549
  (seals for gas appliances and gas equipment)

Superior metrological performance

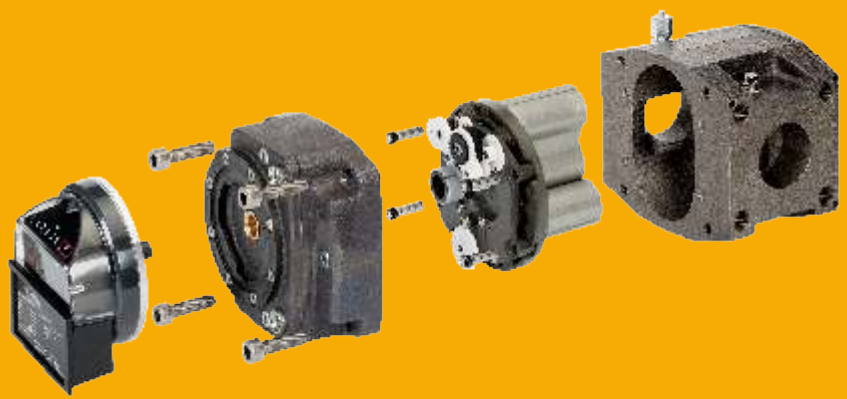
Starting with the G40, all meters are approved according to EN12480:2002, EN12480:2015 and OIML R137 1&2 (2014) for rangeabilities up to 1:160. In situations where the installation or gas conditions are severe, the risk of rejection is greater when recalibration is done against in-service tolerances. The designation of class 1.5 (instead of 1.0), while still maintaining the class 1.0 accuracy limits, could be of interest since the in-service tolerances of a class 1.5 meter are significantly larger than the class 1.0 tolerances.

Cartridge design

All EMR meters consist of an aluminum cartridge inserted in a meter body. The cartridge can be removed and inserted with the body remaining installed This allows local repairs such as replacement of the main bearings and on-site cleaning to be carried out without removing the meter body. Particular owners of older networks, suffering from dirt and/or condensate, will benefit from the ability to remove the cartridge.

Robust construction

In the new cartridge EMR design, the impellers, timing gears and bearings are fixed and positioned by a synchroplate.



- ATEX approvals:
  Sensors compliant with Ex ia IIC T4... T6 Gb
  (-40°C ≤Ta +70°C)
  Encoder compliant with Ex ib IIB T3... T6 Gb
  (-25°C ≤Ta +55°C)
- Body: Compliant to Pressure Equipment Directive
  2014/68/EU

Since this synchroplate is machined in one operation, the tolerances can be controlled and maintained at a very high level. As a consequence, the clearance between the impellers and the meter body is equally divided and as such maximized, making the meters less sensitive to dirt and debris.

The short impeller and high strength shaft connecting the timing gear to the impeller overcomes flexing or bending of the impellers, hence the meters are less sensitive to flow and pressure shocks. Severe intermittent on/off applications are typically handled without damage. Temporarily overloading the meter up to 50% of the maximum capacity will not cause any degradation of the metrological quality.

Basic Index (standard)

The basic index consists of a UV-resistant polycarbonate cover glued to an aluminum frame. The aluminum frame will give strength to the index and as such sufficient protection against mechanical interference (Tampering).
The index is 100% sealed (IP67) by multiple layers of glue. The index can be rotated over 350° for flow directions right-left, left–right and top-down. The index is equipped with multiple LF switches and normally closed tamper contacts.

Universal Index

The extremely strong double walled, aluminum index is designed to withstand any external interference. To protect against large forces applied to the index window, an additional glass window is mounted beneath the polycarbonate window. This glass window will break in case excessive force is applied to the index.
On request the index can be sealed up to IP67. Four slots in the outer extrusion can be used for various add-ons such as multiple connectors, additional outgoing shafts, marking plates with bar codes, etc.

The use of slots makes the index multifunctional and as such “prepared for the future”.

Instrument Drive / Side reading

The instrument drive plate can be used to mount auxiliary equipment like chart recorders or mechanically driven volume correctors.

The rotation of the outgoing shaft is equal to one m^3 or CF or (sub) multiple thereof. A single or double counter can be added to the instrument drive.
The instrument drive can be rotated over 350°, hence allowing both horizontal and vertical installation.
The instrument drive can be equipped with low frequency pulsers, an encoder as well as a reverse flow lock, preventing meters from registering backwards as a result of tampering.
On request the index can be supplied as side reading (without instrument drive) allowing the meter to be installed in an extremely high or low position. The rotating direction of the output shaft can be changed on site.

Options for Indexes and Instrument Drive

The index or instrument drive can be equipped with several options making the meter prepared for the future:
- Magnetic Field Protection Reverse Flow Lock
- Wiegand Pulsers
- Intelligent Index/Encoder
- High Frequency Pulsers
- Tamper Proof

Installation

Installation of ELGAS rotary meters can be horizontal or vertical. Since the meter is designed for multi position, consideration need only be given to the arrows showing the flow direction. After the meter is installed, the index can be rotated to the correct position. The index can be rotated over 350°. ELGAS rotary meters can be metrological sealed to suit various conditions from total flexibility to highly tamper proof.

Maintenance

ELGAS rotary gas meters have a rotating disc for distributing the oil directly to the timing gears.
The mechanism is designed to prevent oil loss at high loads or from pressure variations and maintains sufficient oiling at low flows. Since the oil system operates between 40% and 120% of the maximum flow, sizing of the installation is no longer critical. The oil supplied with the meter is suitable for 10 years of operation under normal conditions.

Cleaning / Easy repair

After removing the front cover of the meter, the entire cartridge can removed for cleaning. During this cleaning process, the meter body can remain in line. For cleaning purposes the seals of the front cover have to be removed. The construction of the ELGAS rotary gas meters allows local repair or replacement of all the main bearings without special tools. If the main bearings are to be replaced, the critical timing of the impellers will be maintained. It is recommended that replacement of the main bearings (mounted in the synchroplate) is performed by a skilled technician in a clean environment. The rear bearings can be replaced with the meter body on site. In a situation where a meter is locked by dirt, the cartridge can be removed for cleaning.

The use of a cartridge (pre-calibrated) and the accessibility of the front and rear bearings without the need for removing the timing gears, make the ELGAS series of rotary meter unique in terms of repair. Any repair shop can repair or re-condition the meters without special skills and tools. When regulation permits, a new, calibrated cartridge can be installed.

EVC mounting

ELGAS rotary meters can be equipped (optional) with two thermo wells and two pressure tapping points. Therefore the rotary meters can be supplied with an Electronic Volume Corrector (EVC). ELGAS offers a large variety in conversion devices so all required data can be provided and the best solution for every project can be assembled. Refer to the special brochure for more information about the Electronic Volume Conversion Devices ELGAS is able to supply or contact a local supplier.

Materials

Body: Aluminum
Impellers: Aluminum
Cartridge: Aluminum
Timing gears: Carbon steel
Bearings: Carbon steel / stainless steel
Shafts: Stainless steel
Gears: Delrin
Index frame: Aluminum
Index cover:Polycarb.ECI

Integrated bypass (security of supply)

Rotary meters are used in a wide variety of industrial applications due to their reliability and accuracy over an extremely large range. Unlike other meter types such as turbine meters and ultrasonic meters, a rotary meter is always accurate unless the rotors become jammed.
In reality, the rotary meter is a digital device, it runs and is accurate or it stops. The only drawback of a rotary meter is that when it stops (locks up), the gas flow is interrupted. As such, there is no security of supply unless precautions are taken.

The most convenient and reliable precaution is to have an automatic bypass valve integrated in the meter. This provides security of supply as the bypass opens automatically when the differential pressure over the meter reaches a certain pre-set level (various springs for different set points are available).

The ELGAS series of rotary meters can be equipped with an automatic bypass (MID approved). The bypass operates as a “reverse” safety shut-off valve, whereby the bypass valve is triggered by an accurate spring loaded diaphragm. When operated, the opened bore allows the full flow of gas to bypass the locked impellers with a significantly lower pressure loss compared to spring loaded bypass systems.

Bypass closed

Bypass open

The mechanism in the bypass works on a high force level (large diaphragm and strong springs) and as such, the bypass is very reliable over its expected life time. With two reed switches (one normally closed, one normally open) the status of the valve can be monitored (e.g. by an EVC). It occasionally happens that an operator will open the inlet or outlet valves too fast and activate the bypass. In such a case, the bypass can be re-set onsite. A removable plug provides access to the reset mechanism. Note: In some countries local authorities require this plug to be sealed.

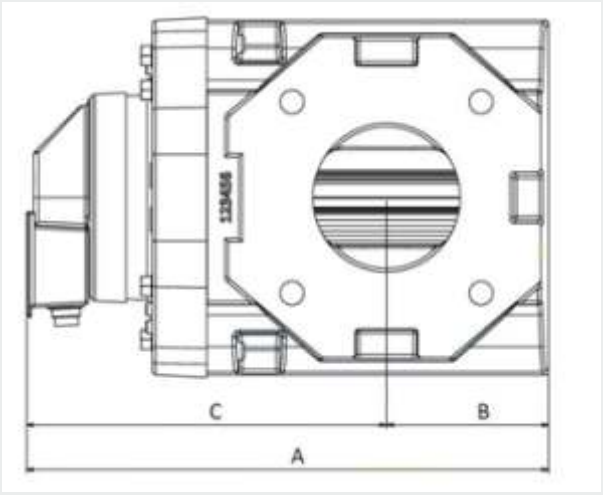
Technical specifications

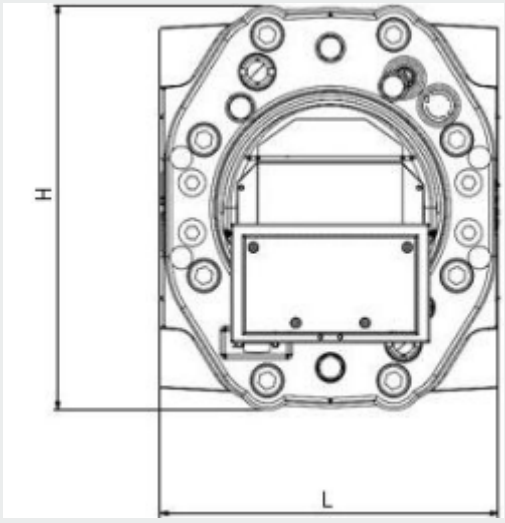
	Performance							
Volume Vc [dm³]	G-value [-]	Qmax [m³/h]	Qmin* Atm. Air [m³/h]	Qt Atm. Air [m³/h]	Diameter D [mm]	Pmax [bar]	?P** [Pa]	Basic Transfer*** [rev-m³]
0.25	G6	10	0.5	1.0	Thr. BSP/NPT	21	8	4004.325
	G10	16	0.5	1.6	Thr. BSP/NPT	21	20	4004.325
	G16	25	0.5	2.5	Thr. BSP/NPT	21	18	4004.325
	G25	40	0.5	4	Thr. BSP/NPT	21	120	4004.325
0.39	G10	16	0.65	1.6	40 or 50	21	12	2574.268
	G16	25	0.65	2.5	40 or 50	21	28	2574.268
	G25	40	0.65	4	40 or 50	21	72	2574.268
	G40	65	0.65	6.5	40 or 50	21	190	2574.268
0.61	G16	25	0.65	2.5	40 or 50	21	25	1638.163
	G25	40	0.65	4	40 or 50	21	64	1638.163
	G40	65	0.65	6.5	40 or 50	21	170	1638.163
	G100	100	0.65	10	40 or 50	21	400	1638.163
	G40	65	0.65	6.5	Thr. BSP 50	21	170	1638.163
0.97	G65	100	1	10	80	21	100	1023.851
	G100	160	1	16	80	21	258	1023.851
0.72	G16	25	0.65	2.5	40 or 50	21	13	1378.968
	G25	40	0.65	4	40 or 50	21	32	1378.968
	G40	65	0.65	6.5	40 or 50	21	85	1378.968
	G65	100	0.65	8	40 or 50	21	200	1378.968
	G100	160	1.6	16	50	12	512	1378.968
1.16	G40	65	1	6.5	80	21	80	861.8609
	G65	100	1	8	80	21	100	861.8609
	G100	160	1	16	80	21	258	861.8609
1.45	G100	160	1.6	16	80 or 100	21	240	689.4840
	G160	250	1.6	25	80 or 100	21	635	689.4840
3.17	G160	250	2.5	25	100	21	90	315.3520
	G250	400	2.5	40	100	21	230	315.3520
5.15	G250	400	4	40	100 or 150	21	106	194.0625
	G400	650	4	65	100 or 150	21	280	194.0625

* Wider range on request in given sizes
** ?P is measured under atmospheric conditions with natural gas with relative density of 0.6 (air = 1)
*** Values may vary 5% due to machining tolerances

Dimensions

	G-value	Performance							
Volume Vc [dm³]	G-value [-]	L	H	A		B [mm]	C		Weight ALU [kg]
		[mm]	[mm]	Univ. [m³/h]	Basic [mm]		Univ. [mm]	Basic [mm]	
0.25	G6	150	163	234	182	33	166	149	5
	G10	150	163	234	182	33	166	149	5
	G16	150	163	234	182	33	166	149	5
	G25	150	163	234	182	33	166	149	5
0.39	G10	171	163	259	242	68	191	174	7
	G16	171	163	259	242	68	191	174	7
	G25	171	163	259	242	68	191	174	7
	G40	171	163	259	242	68	191	174	7
0.61	G16	150/171	163	259	242	68	191	174	7.5
	G25	150/171	163	259	242	68	191	174	7.5
	G40	150/171	163	259	242	68	191	174	7.5
	G65	150/171	163	259	242	68	191	174	7.5
	G40	171	163	259	242	68	191	174	7.5
0.97	G65	171	215	336	319	90	246	90	12
	G100	171	215	336	319	90	246	90	12
0.72	G16	171	202	268	251	72	196	179	12
	G25	171	202	268	251	72	196	179	12
	G40	171	202	268	251	72	196	179	12
	G65	171	202	268	251	72	196	179	12
	G100	171	202	268	251	72	196	179	12
1.16	G40	171	202	320	303	92	228	211	14
	G65	171	202	320	303	92	228	211	14
	G100	171	202	320	303	92	228	211	14
1.45	G100	171/241	202	371	354	118	253	236	15
	G160	171/241	202	371	354	118	253	236	15
3.17	G160	241	288	403	386	160	243	226	38/41
	G250	241	288	403	386	160	243	226	38/41
5.15	G250	241/260	288	518	501	218	300	283	48/51
	G400	241/260	288	518	501	218	300	283	48/51

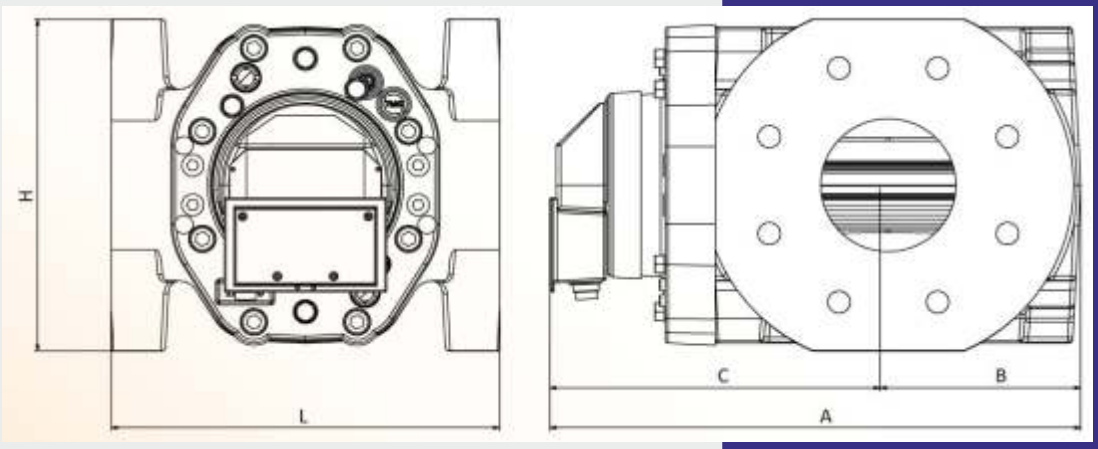




EMR series for pressures up to 30 bar

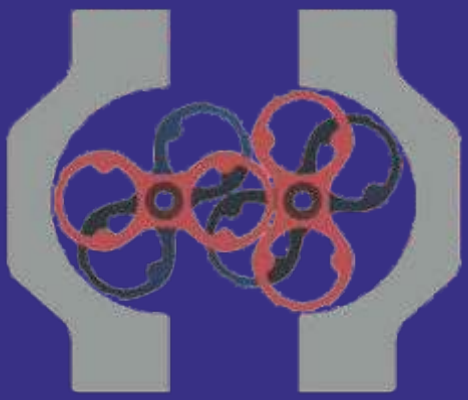
The rotary meters are developed with an optimized body construction. Due to the special design and the strength of the aluminum construction the rotary meters can be used with higher pressures. Since this development has been done as an optimization for the standard aluminum bodies there is no need of a steel body for pressure up to 30 bar.

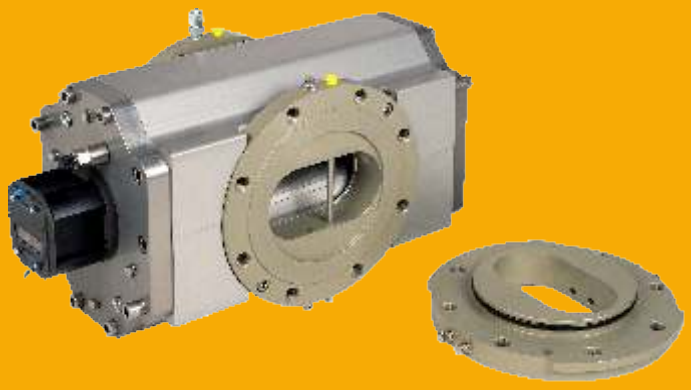
	Performance PN25, PN40 & ANSI300					Dimensions PN25, PN40 & ANSI300							
Volume Vc [dm³]	G-value [-]	Qmax [m³/h]	Qmin	Qt	Diameter	L [mm]	H [mm]	A		B [mm]	C		Weight ALU [kg]
			Atm.Air [m³/h]	Atm.Air [m³/h]	D [mm]			Univ. [mm]	Basic [mm]		Univ. [mm]	Basic [mm]	
1.16	G25	40	0.65	3.2	50	171	202	320	303	92	228	211	11
	G40	65	0.65	3.2	50	171	202	320	303	92	228	211	11
	G65	100	0.65	5	50	171	202	320	303	92	228	211	11
1.45	G100	160	1.6	3.2	80 or 100	241	202	371	354	118	253	236	15
	G160	250	2.5	5	80 or 100	241	202	371	354	118	253	236	15
5.15	G250	400	4	20	100	260	288	518	501	218	300	283	51
	G400	650	4	32	100	260	288	518	501	218	300	283	51



EMR-Dual Series (pulsation free)

Turbine meters have a limited range and must preferably be calibrated close to the operating conditions (high pressure natural gas). This limitation and the higher costs due to the calibration, make the larger rotary meters more popular as replacement for the turbine meter. To overcome the drawback of conventional rotary meters (pulsations and resonance), pulsation free rotary meters have been developed. These pulsation free rotary meters, using two phase shifted pairs of impellers, fully eliminate the pulsations by countering the characteristic sine wave and its resultant resonance. As a result the pulsation free rotary meters series DUAL are extremely quiet and accurate.





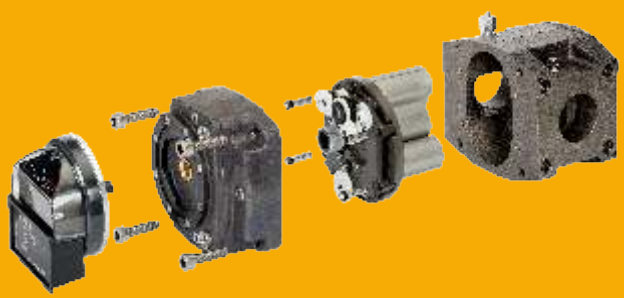
Another advantage is the use of relatively short impellers. Shorter impellers will not deform easily and as such provide reliable long term performance. The weak point of pulsation free meters can be the connection of the two impeller pairs as this mechanical coupling is very sensitive to load differences between the two sets of impellers. The ELGAS DUAL meter uses a significantly stronger spline and spline shaft to connect the two pairs of impellers.

Exchangeable flanges

By using exchangeable flanges, the installation connection of the meter can easily been changed from DIN to ANSI or from DN100 (4") to DN150 (6").

Performance & dimensions EMR-dual Series

	Performance					Dimensions Dual							
Volume V [dm³]	G-value [-]	Qmax [m³/h]	Qmin	Qt	Diameter	L [mm]	H [mm]	A		B [mm]	C		Weight STEEL [kg]
			Atm.Air [m³/h]	Atm.Air [m³/h]	D [mm]			Univ. [mm]	Basic [mm]		Univ. [mm]	Basic [mm]	
2.41277	G160	250	2.5	16	100	241	288	446	429	186	260	243	32
	G250	400	2.5	25	100	241	288	446	429	186	260	243	32
3.96382	G250	400	4	25	150	260	288	554	537	249	305	288	41
	G400	650	4	40	150	260	288	554	537	249	305	288	41
6.34212	G400	650	6.5	40	150	260	288	692	675	318	374	357	51
	G650	1000	6.5	65	150	260	288	692	675	318	374	357	51



EMR-HP series (for pressures up to 100 bar)

The EMR-HP series of rotary gas meters is designed to meet the highest demands of reliable and accurate measurement of gas flow under high pressure conditions. The meters fully comply with the EN12480:2002, EN12480:2015 and OIML R137 1&2 (2014) and as such can be used for all custody transfer applications.

The actual meter body is made from aluminum and is kept in position by steel meter housing. This housing holds the meter body, without any stress, in position between the adjacent flanges. Since the meter body is not affected by stress from the flanges or the piping, the clearances between the impellers and the body are optimized. As such the superb metrological performance achieved in the low pressure ELGAS rotary meter is maintained under high pressure conditions as well.

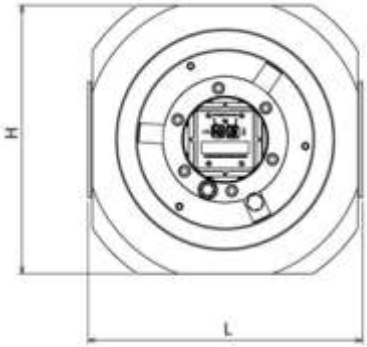
Due to the large rangeability of 1:100, the EMR-HP rotary meter is very suitable for small city gate stations as the actual load of this type of station varies widely. Square impellers and improved position of the main bearings makes the cartridge very robust and less sensitive to flow and pressure shocks. Unlike other approved flow metering devices, such as turbine meters and ultrasonic meters, a rotary meter can be installed close to regulators and without the need for extended straight pipe or specially prepared inlet sections.

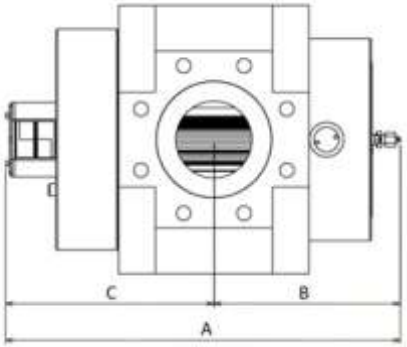
Bypass for security of supply

The EMR-HP series can be equipped with a spring loaded bypass valve. If a meter locks, the differential over the bypass valve will increase and the valve will open allowing gas to pass. This security of supply feature makes the EMR-HP suitable for use in critical installations where gas flow cannot be interrupted. The opening of the bypass can be monitored by measuring the differential over the meter.

Performance & dimensions EMR-HP series

Performance						Dimensions High Pressure (STEEL)							
Volume V [dm³]	G-value [-]	Qmax [m³/h]	Qmin Atm.Air [m³/h]	Qt Atm.Air [m³/h]	Diameter D [mm]	L [mm]	H [mm]	A		B [mm]	C		Weight STEEL [kg]
								Univ. [mm]	Basic [mm]		Univ. [mm]	Basic [mm]	
0.39	G10	40	0.4	4	40 or 50	240	240	364	347	150	214	197	65
	G16	40	0.4	4	40 or 50	240	240	364	347	150	214	197	65
0.61	G25	65	0.65	6.5	40 or 50	240	260	353	323	114	239	209	65
	G40	65	0.65	6.5	40 or 50	240	260	353	323	114	239	209	65
0.72	G40	65	1	6.5	50	273	260	353	323	114	239	209	65
0.85	G65	100	1	10	50	240	260	404	374	118	286	256	73
1.16	G65	100	1	10	50	273	260	404	374	118	286	256	73
1.45	G100	160	2.5	16	80	273	260	436	406	134	302	272	85
3.17	G160	250	4	25	80 or 100	375	363	493	463	215	278	248	168





PRELIMINARY

Rotary gas meter with integrated gas volume corrector

EMRi series

Highlights

- Compact design
- High precison RPD gas meter body
- Latest generation of ELGAS gas volume corrector
- GSM/GPRS, 3G, 4G or NB modem available
- Tamper proof
- Designed for outdoor installations
- High accuracy and stability of measurement
- Long battery life
- Designed for hazardous area ZONE 0

We took the best from RPD gas meter and EVC, and the result is.....

..... new EMRi series rotary gas meter.

Introduction

The integrated rotary gas meter EMRi presents the new way how to things has been changed due to technological progress. As in many countries customers ask for smart solutions, and the amount of installations increased in the last years, the field maintenance became under cost scope especially in the countries with higher labour costs. So we tried to create the product which could save customers budget and to preserve all functionality as the separate solutions.

The main concept is based on our EMR rotary gasmeters which design was modified to be integrated with new EVC head to reborn into new single unit: integrated gasmeter

Main advantages:

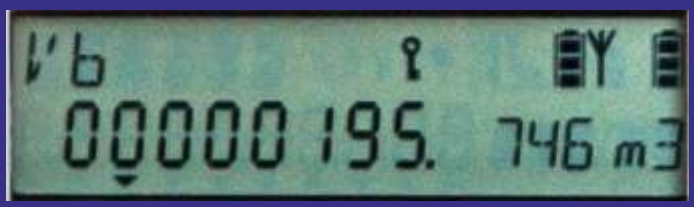
- Single unit without useless cables
- Small compact design
- Batteries and communication module exchangeable on site without special tools

The EMRi meter can be supplied in 2 different configurations: as full PTZ device or just T-corrector.

In next step we want to apply this concept also for gasmeters of third parties using customized adaptors according to technical specifications of given bodies types. This would allow also upgrade of some present units to new smart devices (if all necessary inputs would be accessible for connection).

Basic features:

- Flow range 0.5 – 650 m3/h
- Diameters DN25 – DN150 (1" – 6")
- Pressure rates PN 10 – 100, ANSI 150 – 600
- Compliant with EN12405-1+A2, EN12480:2015, OIML R137 1&2 (2014), MID 2014/32/EU
- MID temperature range -40 to +70°C
- Robust construction
- Compact installation
- High precison RPD gasmeter body
- Latest generation of ELGAS gas volume corrector
- GSM/GPRS, 3G/LTE or LoRa modem external communication module available
- Tamper proof
- Designed for outdoor installations
- High accuracy and stability of measurement
- Long battery life
- Designed for hazardous area ZONE 0



Technical specifications

Housing	Glass fiber polycarbonate (meter head) Aluminium (gas meter body)
Protection class	IP 65
Display	Alphanumeric single line multisegment backlit LCD (working from -40 °C; always ON)
Battery power supply	Lithium battery pack
Measuring temperature range	-25°C to +60°C (optionally from -40°C)
Communication interface	optical interface (EN 62056-21) 2G/3G/4G/NB modem
Dimensions	Depending on the meter size
Weight	

Your local ELGAS business partner

Project
MARKETING PROMOTION
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Support for participation in foreign exhibitions and fairs

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www.elgas.cz

sales@elgas.cz

Semtínská 211
533 53 Pardubice, Czech Republic

+420 466 414 500
+420 466 414 511