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Smart, safe and accurate.





A Step Ahead



MADE IN INDIA, FOR THE WORLD



AS LEADERS IN MANUFACTURING INDUSTRY,

Capital has set the bar with its unwavering commitment to quality and exceptional client service. Through our extensive inventory of diverse and customizable products, our talented team goes above and beyond to make sure your needs are met, and expectations exceeded.

ABOUT CAPITAL

- Capital Innotech Pvt. Ltd. established in 2020 has achieved the milestone of supplying 1MN G1.6 meters to utilities across India.
- Our manufacturing facility is spread across 3 acres of land located at Udaipur, Rajasthan.
- The state-of-the-art facility is India's first fully integrated manufacturing plant for gas meters with world class infrastructure in-house such as Metal casing, Injection Moulding, CNC Ports, PC, CED along with assembly, testing, calibration, packing, etc.
- Our offering includes complete range of Gas meters:
 - Domestic diaphragm G1.6, G2.5 & G4
 - Commercial diaphragm G6, G10, G16 & G25
 - RPD G10, G16, G25, G40, G65, G100, G160, G250, G400, G650 & G1000
- EVC (Electronic Volume corrector)
- End to End solution for smart meters includes meter with AMR module integrated, Head End system (HES) software, Mobile application, etc. for:
 - Pre-paid SMART meters
 - Post-paid AMR meters

APPROVALS



**EN
1359**

**EN
16314**

**EN
12480**

MID - B



**ISO
9001**

**ISO
14001**

**ISO
27001**

MID - D

FULLY INTEGRATED GAS METER MANUFACTURING PLANT



01

PRESS SHOP

03

POWDER COATING

05

BAKE LITE

02

CED

(CATHODIC ELECTRODE DEPOSITION)

04

INJECTION MOULDING



07

EP
(ELECTRO PLATING)

09

CALIBRATION

06

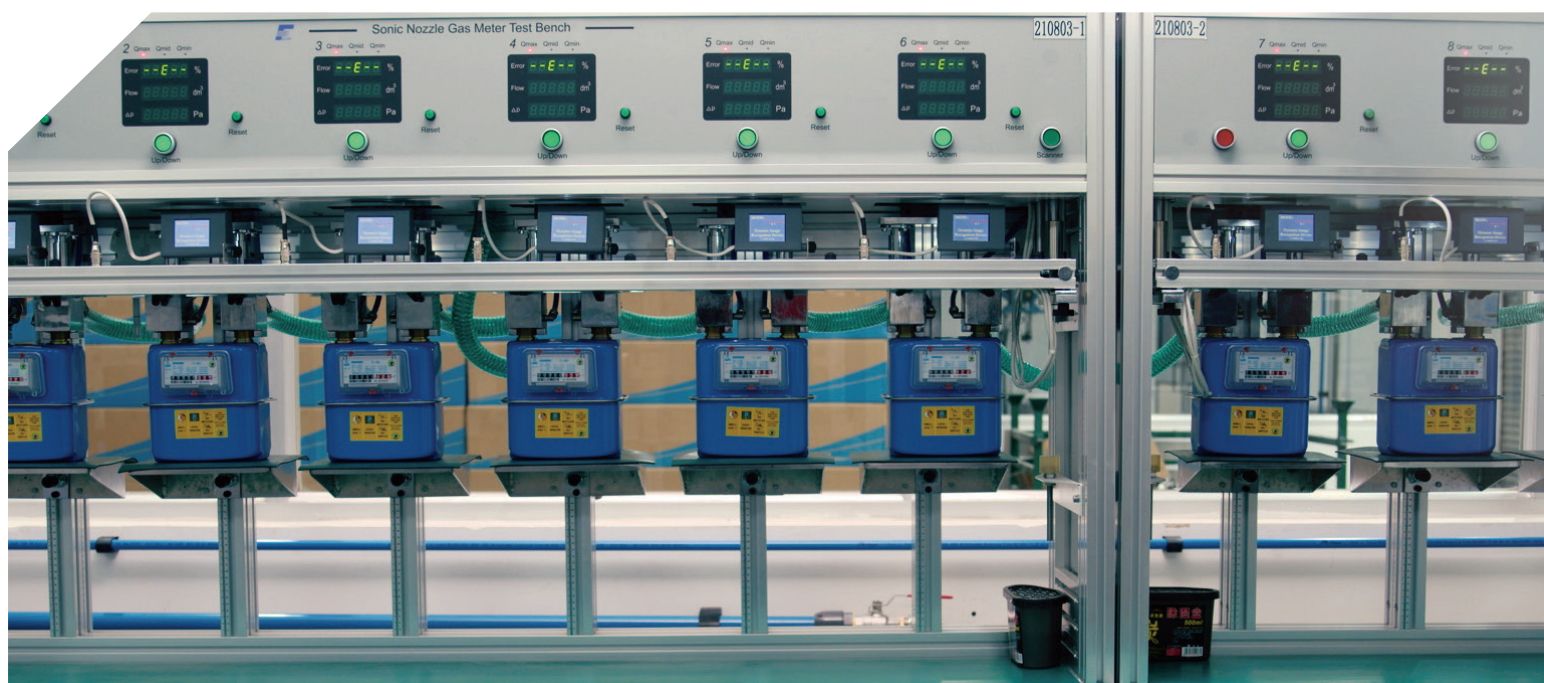
CNC MACHINE
SHOP

08

ASSEMBLY
& TESTING

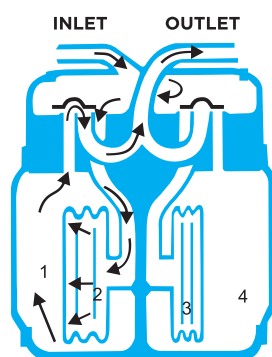
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R&D

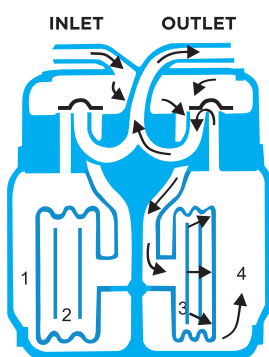


OPERATING PRINCIPLE

CAPITAL GAS METERS



Chamber 1 is emptying, 2 is filling, 3 is empty and 4 has just filled.



Chamber 1 is now empty, 2 is full, 3 is filling, and 4 is emptying.



Chamber 1 is filling, 2 is emptying, 3 has filled, and 4 has emptied.



Chamber 1 is now completely filled, 2 is emptying, 3 is emptying, and 4 is filling.

DOMESTIC GAS METER

G1.6/G2.5/G4



FLOW RANGE
(0.016-6m³)

COMMERCIAL GAS METER

G6/G10/G16/G25



FLOW RANGE
(0.04 - 40m³)

The diaphragm gas meter is based on displacement metering principle. The gas meter consists of 4 chambers separated with diaphragm. The movement of the diaphragm is due to the pressure difference between the inlet and the outlet of the meter. The chambers are filled and emptied periodically, and the reciprocating movement of the diaphragms are transferred via crankshaft & gear to the index.

APPLICATION

CAPITAL GAS METERS

- Natural gas
- Propane
- Butane
- Nitrogen
- Hydrogen-blended natural gas
- Non-corrosive gases



A photograph of a row of white medical syringes with black plungers, arranged in a line on a highly reflective surface. The syringes are in sharp focus in the foreground, with their reflections clearly visible below them. In the background, more syringes are visible but are out of focus. The overall color palette is dominated by the white of the syringes and the blue-green tint of the background and reflection.

QUALITY ASSURED
ALWAYS!

Smart, Safe, and Accurate.

FEATURES CAPITAL GAS METERS

- COMPACT DESIGN
- ROBUST, MAINTENANCE FREE
- REVERSE FLOW RESTRICTOR TO PREVENT REVERSE FLOW OF GAS.
- RIGHT HAND SIDE ENTRY VARIANT AVAILABLE ON REQUEST
- MAGNETIC PULSE TRANSMISSION.
- LONG TERM ACCURACY AND RELIABILITY
- IP RATING – IP65
- INNER ROTARY PARTS WITH SELF-LUBRICATING MATERIAL TO REDUCE NOISE LEVEL
- IMMUNE TO MAGNETIC TAMPERING
- SMART METERING COMPATIBILITY
- EASY TO RETROFIT ON SITE WITHOUT RECALIBRATION



A Step Ahead



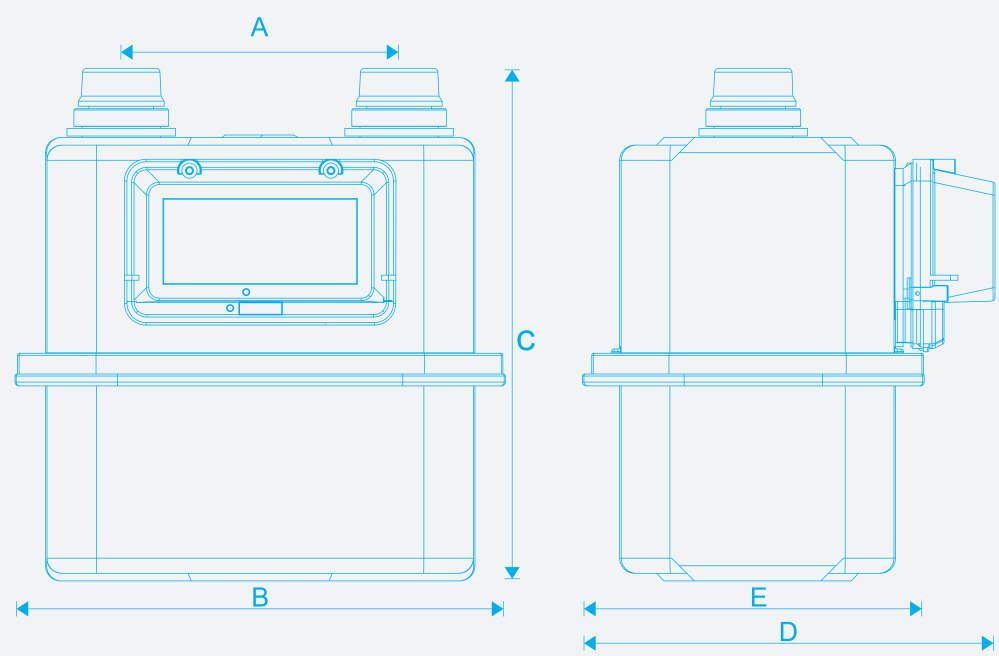
TECHNICAL SPECIFICATIONS

CAPITAL GAS METERS

TYPE	G 1.6MS /G1.6S	G2.5MS/ G 2.5S	G 4.0S
Maximum Flow Rate (Qmax.)	2.5 m3 /h	4.0 m3 /h	6.0 m3 /h
Minimum Flow Rate (Qmin.)	0.016 m3 /h	0.025 m3 /h	0.040 m3 /h
Maximum Operating Pressure	0.5 bar		
Maximum Pressure Loss	≤2 mbar		
Cyclic Volume	0.9 / 1.2 dm ³	0.9 / 1.2 dm ³	1.2 dm ³
Compliance	MID Class 1.5 EN1359:2017		
Index Maximum Indication	99999.999 m3		
End Connection Distance	110.0 mm		
Ingress Protection	IP 65		
Resistance to High Temperature	"T"- Marking -25°C to +60°C		
Temperature	-25°C to +70°C (Storage)		
Humidity	96 % Non-Condensing		
End Connections	3/4" NPT Standard (BSP or BS 746 or 1" NPT on request)		

DIMENSIONS

CAPITAL GAS METERS

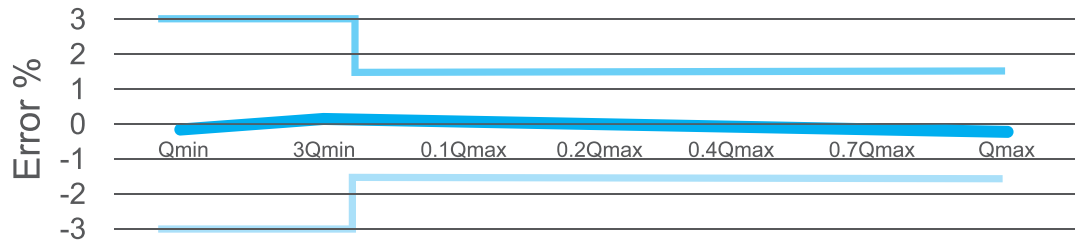


TYPE	A	B	C	D	E
G1.6MS/ G2.5MS	110	192.5	196.5	159.5	131.5
G1.6S/ G2.5S/ G4S	110	205	217	167	137

* All dimensions in mm

ACCURACY CURVE

CAPITAL GAS METERS



SMART GAS METERS

SMART GAS METER WITH PLUG & PLAY SMART MODULE, PRE-PAID FUNCTIONALITY, END TO END SMART GAS METER SOLUTIONS, HEAD END SYSTEM (HES) & CLOUD.

FEATURES

- Pre-paid & Post-paid Configuration.
- Replaceable SIM cards
- Replaceable Battery (calculated for 10 years in controlled environment).
- Remote readings optimizing cost of operations
- Remote price setting/change options.
- In-built valve for pre-paid meters
- Cyclic volume 0.9/1.2 dm³
- Operating Temperature -25 C to +60 C
- Remote valve shut-off
- Data logger to store hourly meter readings upto 180 days

COMMUNICATION

- Communication technology: NB-IOT/ LoRa WAN
- Optional: Bluetooth (secondary mode of communication)
- Encrypted data, ensuring data security
- Event triggered alarms/feedback for corrective actions

USER INTERFACE

- User friendly interface with LCD display.
- Mobile application for quick access to recharge, check historical data
- Touch button on module to check balance, reading

APPROVALS

- ATEX – Zone 2
- IP 65
- WPC/ETA

ALERTS

- Magnetic tamper
- Tilt tamper
- Low battery
- Cover open
- Battery removal
- Disconnection
- Low balance

SMART GAS METERS

DOMESTIC RIO



DOMESTIC VOLTA



COMMERCIAL RIO



RPD + EVC



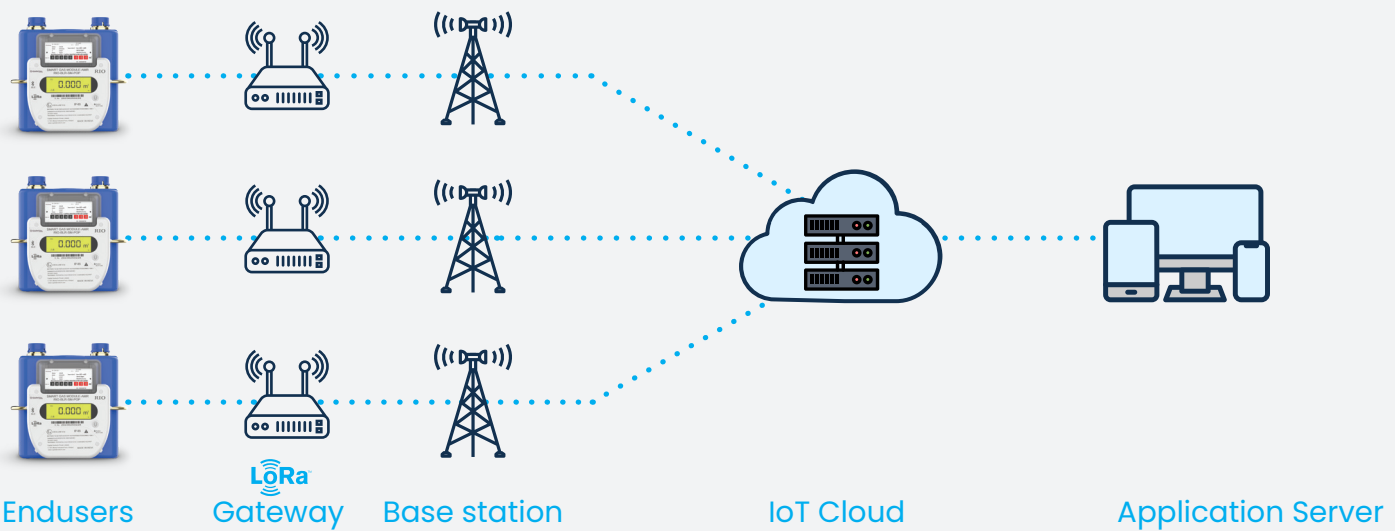
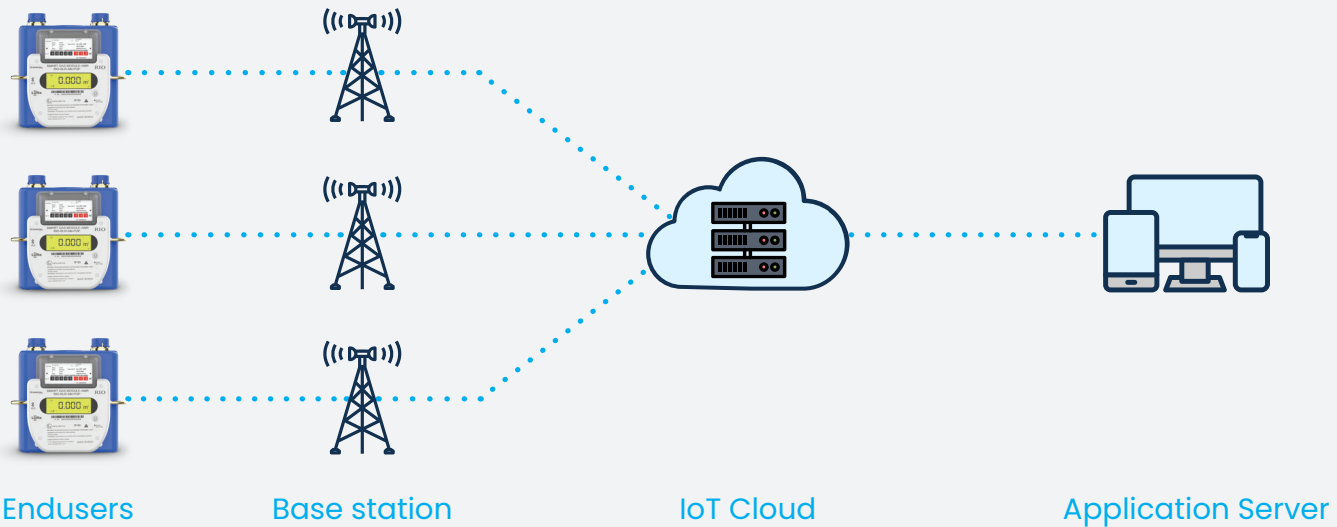
TECHNICAL SPECIFICATIONS

Description	Details
ATEX	Ex II 3G Ex ic IIB T3 Gc
Input Pulse Characteristics	Magnetic
Operating Temperature	-25° to +60°C
Ingress Protection (IP)	IP65
Power Supply	Lithium battery
Pre-Payment Features	In-built valve to disconnect gas supply
Battery Lifespan	10 years considering communication once per day
Battery replacement	Can be replaced at site
Communication	NB-IoT/LoRa WAN



SMART METERS ARCHITECTURE

NB-IOT



COMMERCIAL DIAPHRAGM METERS

CIPL commercial series (G6, G10, G16 and G25) of diaphragm gas meters are positive displacement gas meters, which are widely used for accumulative measurement of natural gas, liquefied gas, city pipeline gas etc. Recommended working pressure 0.5~10kPa, the pressure tightness of the whole machine can reach upto 75kPa.

HIGH MEASUREMENT ACCURACY

The accuracy standard applied is higher than national standard and reaches Class 1.0 level,

STABLE PERFORMANCE

The unique structural design makes that the products have no obvious attenuation of metering stability in long-term operation and have long service life.

LOW PRESSURE ABSORPTION

The product's low pressure absorption is achieved by optimizing the fitting clearance and flow channel of parts, and adopting high-quality dynamic sealing materials.

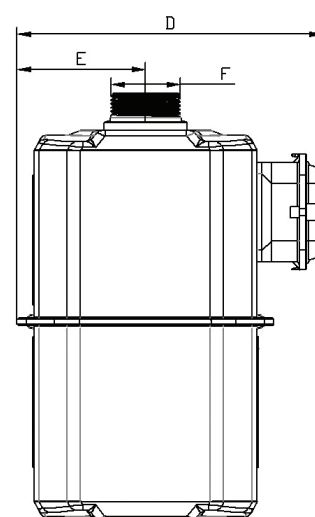
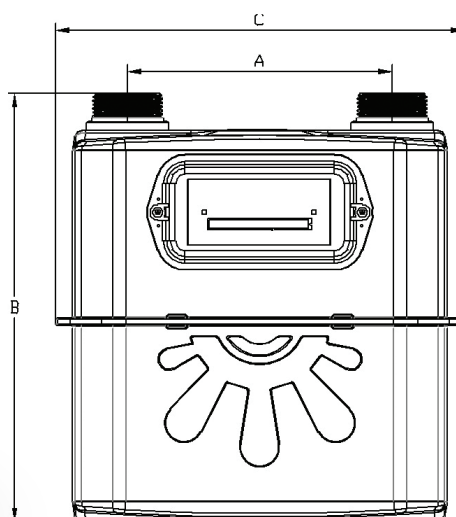
SAFETY AND RELIABILITY

The gas meter adopts a closed magnetic transmission output structure, which eliminates the fatigue wear leakage of the dynamic rubber sealing ring, and the cold-rolled steel shell package has good pressure resistance.

GOOD CORROSION RESISTANCE

The shell is made of high-quality galvanized steel plate, the internal metal parts are made of aviation antirust aluminum or stainless steel, the rubber parts are made of modified nitrile rubber with unique formula, and the diaphragm capsule is made of high-quality engineering plastics. Both parts and the whole meter have excellent corrosion resistance.

NO.	ITEMS	UNIT	SPECIFICATIONS AND PARAMETERS			
			G6	G10	G16	G25
1	Nominal flow	m³/h	6	10	16	25
2	Maximum flow q _{max}	m³/h	10	16	25	40
3	Minimum flow q _{min}	m³/h	0.06	0.1	0.16	0.25
4	Transitional flow q _t	m³/h	1	1.6	2.5	4
5	Ambient temperature t _m	°C	-20 ~+55			
6	Storage temperature	°C	-25 ~+60			
7	Maximum working pressure p _{max}	kPa	50			
8	Indication error	%	q _t ≤q≤q _{max} :±1.2 ;q _{min} ≤q<q _t :±2.5			
9	Pressure absorption	Pa	≤200		≤300	
10	Cyclic volume V _c	dm³	2.5	5	8	15
11	Maximum degree	m³	99999.999	999999.99		
12	Minimum scale value	dm³	0.2	2		



MODEL SIZE	CENTER DISTANCE A (MM)	HEIGHT B (MM)	WIDTH C (MM)	THICKNESS D (MM)	BACK MARGIN E (MM)	JOINT THREAD F	WEIGHT (KG)
G6	160	259	248	185	78	G1½	4
G10	200	327	316	215	96	G2	8
G16	240	375	355	237	107	G3	10
G25	300	437	440	285	132	M80*3	15.5

≤300

ROTARY POSITIVE DISPLACEMENT METERS APPLICATIONS

The RPD rotary displacement gas meter is a high precision instrument for gas volume measurement and flow measurement of natural gas and other non-aggressive gases in gas stations and plants.

KEY FEATURES

- Meter sizes G 10 to G 1000
- Flow rates from 0.4 to 1600 m³/h
- Nominal sizes from DN 25 to DN 200
- Pressure class PN 10/16 and ANSI 150*
- No special servicing is required after installation. Generally the oil must be replaced at least every 5 years.
- Meter housing made of anodized high strength Aluminum
- Index head by default made of synthetic material, optional made of Aluminum
- Rotating counter (355 °)
- No inlet or outlet section required
- Horizontal and vertical mounting position
- Approvals according to MID (2014 /32 /EU), OIML, PED (PED 2014/68/EU), ATEX

DESCRIPTION AND OPERATION

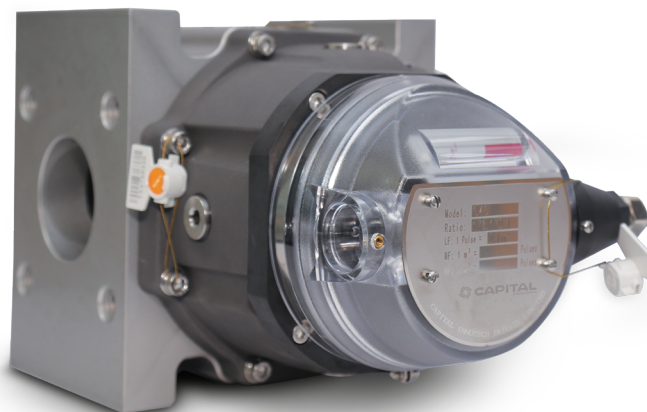
The RPD rotary gas meter registers the operating volume using an eight-digit mechanical counter. Via pulses the operating volume can be transferred to an electronic volume corrector and converted to normal or standard conditions. The RPD rotary meter is approved for custody transfer according to MID (2014 /32/EU) / OIML.

Rotary gas meters are operating according the displacement principle. In the meter housing are two 8-shaped coordinated rotating pistons without touching each other. The measuring chamber is regularly filled and emptied by the rotation. During each revolution four crescent-shaped volumes are moved through the measuring chamber, in which the rotation speed is proportional to the gas flow. The rotation of the pistons is synchronized by a gear train outside the measuring chamber.

* 16 BARG MAX. WITH MID-CERTIFICATE

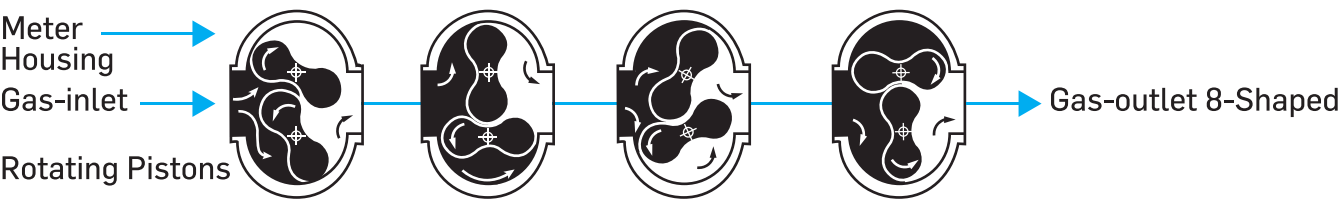
The actual volume flow can be transmitted to electronic volume correctors or data loggers via low frequency (LF) pulses generated by Reed contacts. In the meter's index head is also located an anti-tampering contact.

Rotary gas meters are characterized by a very compact design and high accuracy. The RPD rotary meter requires no inlet or outlet pipe and is insensitive to severe gas flow fluctuations (discontinuous operation).





OPERATING CYCLE



TECHNICAL SPECIFICATIONS	
Gas temperature:	-25 °C to +55 °C
Ambient temperature:	-25 °C to +55 °C
Storage temperature:	-30 °C to +60 °C
Operating pressure:	16 bar (g)
Protection class:	IP 67
Materials:	
● Meter housing:	Aluminum Alloy
● Pistons:	Aluminum Alloy
● Synchronization wheels:	Stainless steel
● Meter index head:	Synthetic material (standard), optional Aluminum
ATEX-Approval:	Ex-Zone 1
Approvals	OIML R137 and EN12480
Repeatability:	< 0.1 %
Overload:	Short term up to 1.25 Qmax
Pressure change rate:	< 350 mbar/s
Counter:	Eight-digit mechanical roller counter
Meter index head:	Synthetic material(standard), Aluminum as an option Bi-directional index is available as an option(irrespective of the flow direction, forward or reverse, the index always positively accumulated) Index with mechanical drive instrument as an option
Pulse output:	1 LF-pulser (Reed contact) and 1 anti-tampering contact Option: 2 LF-pulsers (Reed contacts) and 1 MF -Pulser(only with aluminum index) and 1 HF-pulser
Connections:	
● Pressure:	2 connections (1 inlet and 1 outlet) with ¼" NPT - thread
● Temperature:	2 x thermowell (1 inlet and 1 outlet) with ¼" NPT - thread (option)

ERROR LIMITS AND TYPICAL ERROR CURVE

ACCORDING TO EN 12480 MAXIMUM PERMISSIBLE ERROR LIMITS:

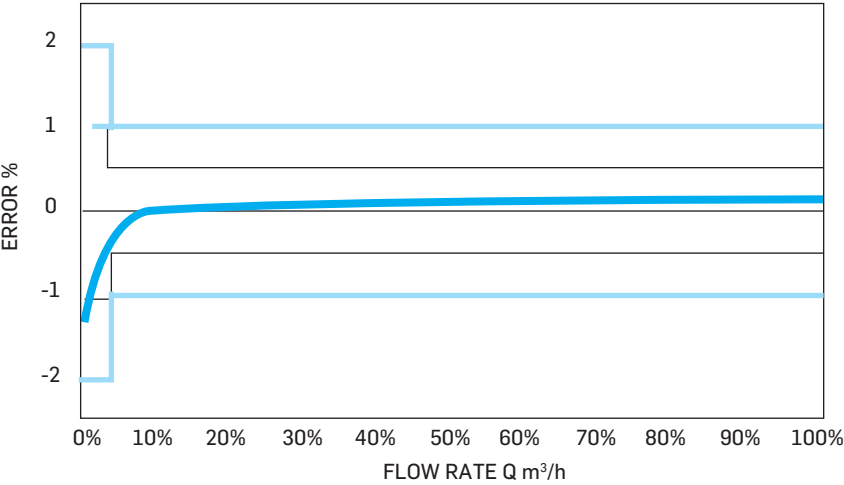
$Q_{min} \leq Q < Q_t: +2.0 \%$
 $Q_t \leq Q \leq Q_{max}: +1.0 \%$

QT = DEPENDS ON THE MEASURING RANGE:

The initial calibration of the rotary meter RPD will always render results smaller than the maximum permissible errors defined by the international standards of EN 12480 and OIML. Lower calibration errors with only half the maximum permissible errors are available upon special request.

G-Type	Qt
G 10, G 16	0,1 Qmax
G 25 to G 1000	0,05 Qmax

TYPICAL ERROR CURVE



The rotary meters RPD show very stable and reproducible measurement results. The design of the housings and pressure containing parts has been optimized especially for robustness under torsional and bending stresses. The meters can withstand more than double the specified torsional and bending stresses implied through the installation as defined in EN 12480.

The lifetime durability of the RPD rotary meter is very stable due to the large dimensioned high precision ball bearings “made in Germany” along with the high precision machining of the body and all moving parts. After machining all aluminum parts are hard anodized for less friction and higher resistance to wear and tear.



PERFORMANCE DATA

DN [mm]	G-Type	Qmin [m3/h]	Qmax [m3/h]	Standard Rangeability	V [dm3]	LF [imp/m3]	MF [imp/m3]	HF [imp/m3]	Screwed connection
25	10	0.4	16	1:40	0.177	10	100	28098.8	RF/F-F
*1 1/2	16	0.5	25	1:50	0.210	10	100	23744.75	RF/F-F
50	16	0.5	25	1:50	0.210	10	100	23744.75	RF/F-F
50	25	0.5	40	1:80	0.283	10	100	17617	RF/F-F
50	40	0.5	65	1:130	0.566	10	100	8808.5	RF/F-F
50	65	0.5	100	1:200	0.708	10	100	7035.45	RF/F-F
80	100	0.65	160	1:250	1.05	1	10	4748.95	RF/F-F
80	160	1.6	250	1:160	2.78	1	10	1795.2	RF/F-F
100	160	1.6	250	1:160	2.78	1	10	1795.2	RF/F-F
100	250	2.0	400	1:200	4.20	1	10	1187.25	RF/F-F
100	400	3.2	650	1:200	5.66	1	10	883.2	RF/F-F
150	400	6.5	650	1:100	10.5	1	10	476.625	RF/F-F
150	650	10.0	1000	1:100	15.7	1	10	317.75	RF/F-F
200	1000	16.0	1600	1:100	19.7	0.1	1	253.675	RF/F-F

*NPT Screwed connection

The rotary meters RPD are manufactured with large measurement ranges due to the precision machining of the parts and a very reproducible assembly process.

DN [mm]	G-Type	Pressure loss [mbar] at Qmax and p = 1 bar.a Air (p = 1.2 kg/m ₃)
25	10	0.8
50	16	1.5
50	25	1.3
50	40	2.4
50	65	4.2
80	100	4.2
80	160	5.0
100	160	3.9
100	250	5.0
100	400	7.0
150	400	4.3
150	650	4.7
200	1000	6.5

The pressure loss of the RPD meters is extremely low due to the very small manufacturing tolerances and the high precision, low friction parts. With the very low pressure loss the RPD rotary meters are very well suited for use in low pressure applications for burners or other processes requiring very tight process parameters.

DIMENSIONS, WEIGHTS AND CONNECTIONS

G - Type	DN [mm]	C[mm]	A[mm]	Housing dimensions			K[mm]		Weight [kg]
				B[mm]	H[mm]	L[mm]	PN16	ANSI150	
10	25	300	197	103	125	130	85	79.4	4.8
16	50	315	200	115	150	171	125	120.7	4.5
25	50	353	219	134	150	171	125	120.7	8.0
40	50	357	218	139	180	171	125	120.7	10.0
65	50	387	233	154	180	171	125	120.7	11.5
100	80	461	270	191	180	171	160	152.4	15.0
160-3	80	485	278	207	240	241	160	152.4	27.5
160-4	100	485	278	207	240	241	180	190.5	28.0
250	100	598	334	264	240	241	180	190.5	38.5
400	100	720	397	323	240	241	180	190.5	48.5
400	150	688	378	310	460	450	240	241.3	102
650	150	826	447	379	460	450	240	241.3	125
1000	200	932	500	432	460	600	295	298.5	145



ELECTRONIC VOLUME CORRECTOR (EVC)

PRODUCT OVERVIEW

TEC -III is a gas volume corrector that enables PTZ, PT or T conversion. The device is designed to measure volume, energy and flow gas. Primarily battery powered with the possibility to connect external power supply.

APPROVALS

TEC- III accords with standard EN 12405- 1:2021 and EN 12405-2:2012.
ATEx accords with intrinsic safety explosions proof standard EN60079-0, EN60079-11, Housing protection meets IP66 of standard EN60529.



MAIN ADVANTAGES

- Industrial housing cooperates with various types of gas meter like turbine, rotary, ultrasonic by LF, HF, Namur, Reed contact, Encoder.
- Friendly user menu interface, equipped with 256x160 monochromatic dot matrix LCD display and 6 – buttons touch screen.
- 4 Independent serial transmission ports (2xRS485/RS232 + Optical interface 62056-21+ Bluetooth 5.0).
- Built-in GSM 2G/3G,4G, NB-Iot modem (Option).
- Various I/O interfaces: upto 7 configurable inputs, Upto 4 binary or frequency outputs with Photoelectric isolation.
- Low -Power consumption design, built-in lithium battery to provide power for more than 6 years under the specified operating mode, up to three batteries.
- Large capacity and varieties of metering data records and event archives function, Non- volatile in the lifetime (periodic record, daily record, monthly record, event archive, etc).
- Multi- Level security protection: Independent hardware switch, seal sticker, lead seal, login password.
- With tamper-proof magnetic interference detection and opening cover detection alarm.
- Optional additional second external pressure transducers based on a built-in temperature sensor for comparison.
- Additional 4mA-20mA two wire analogue current output, the parameters can be configured.

TECHNICAL SPECIFICATIONS	
Housing Material	Aluminum Alloy
Dimensions	202x183x72mm
Weight	2.5 kg
Display	Dot Matrix LCD 256*160-graphic 4*
Keyboard	6 Bottoms touch screen: up, down, left, right, enter, return,
Base Conditions	Adjustable by authorized service personnel, available options, <ul style="list-style-type: none">● I Reference pressure pb(absolute): default 1,01325 bar● I Reference temperature Tb: default 273,15k (Ooc)● I Reference temp for combustion Tl:default 298,15k(250C)
The Maximum permissible error (MPE) according to standard” EN 12405-1”	0,5% at reference conditions: 1% at nominal operating conditions.
The Maximum permissible error (MPE) according to standard” EN 12405-2”	ECD Class A
Algorithms for calculations of compression factor:	SGERG-88, AGA8-92, AGA8-G-2, AGA NX-19 mod constant compression factor k1
Relative Humidity	Max 95% at temp.70oC
Ambient Temperature Range	-25*c to 55*c (MID Certified)-25*C to 70*C (Without MID)
Hosing Protection Level:	IP 66(EN 60529)

TECHNICAL SPECIFICATIONS

Environment Conditions class (Mechanical/ Electromagnetic)	M2/E2
Ex Classification (According to EN60079-0, EN60079-11)	(Ex) II 1G Exia IIB T4 Ga (Ex) II 2G ib IIB T3 Gb
Internal Supply for EVC	D-size lithium 3.6V/19Ah (up to 3 batteries when without modem) under specified condition:6 years/pcs
Internal Supply for MODEM	D-size lithium 3.6V/19Ah, operating TIME:6 YEARS (2 Communications per day)
External Supply	Intrinsically safe power supply INT-S3 or other (supply output 6.5V DC+ _10% supply input 12 to 24v DC+ _10%)
Transmission Ports	L2 independent serial transmission ports, speed up to 192.00 bps: com1, com2 standard Rs-48s (Optical interface COM3[EC62056-21 IGSM2G/3G, 4G, NB-IoT option Bluetooth 5.0 option,
Transmission Protocols	MODBUS RTU, other Protocols, can be customized on request.
Measuring Pressure (bar, abs)	IP1 external pressure-Screw thread NPT1/4 customizable, I pressure range option: 0.8-2/1-5/2-10/4-20/10-50/20-100/0.8-10/7-100 mid Certified 0.8-5/0.8-20/1-35/1-50/2-70/5-120 no MID (Maximum permissible errors of p1 MPE +0.2% of measured value standard condition +0.5% of measured value standard condition P2 external, optional-absolute pressure built-in temperature
Measuring temperature	(Temperature sensor 4-wire diameter less than 6mm) (Temperature range:-30o C to +80Oc) I Maximum permissible errors of T1 MPE +0.1% of measured value base condition +.02% of measured value operating condition
Inputs	Up to 7 Ex digital inputs: -2 LF inputs reed contact, pulse, signal, -2 TS tamper protection switch closed be fault -1 HF inputs frequency up to 5kHz EN60947-5-6 -2 Ex digital inputs, Binary input
Outputs	L4 Ex digital OC outputs separated: -1x configurable-binary or frequency up to 5kHz -3x configurable binary open collector type
Analog Outputs	4Ma-20Ma two-wire analogue current output, +0.25% FS output error of Q or Q optional
Registration Periods	I Periodic records-1440 records I Hourly records-11500 records (Daily records-4 years [Monthly records-more than 30 years start-stop records-1000 records)
Event Archive	Alarm event IoT communication event, resetting event, Calibration log, gas component change log

