Exhibit No.:
Issue: *Automated Meter Reading Opt-out Tariff*
Witness: *Claire M. Eubanks, PE*
Sponsoring Party: *MoPSC Staff*
Type of Exhibit: *Rebuttal Testimony*
Case No.: *GR-2021-0108*
Date Testimony Prepared: *June 17, 2021*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRIAL ANALYSIS DIVISION

ENGINEERING ANALYSIS

REBUTTAL TESTIMONY

OF

CLAIRE M. EUBANKS, PE

SPIRE MISSOURI INC., d/b/a SPIRE
SPIRE EAST and SPIRE WEST
GENERAL RATE CASE

CASE NO. GR-2021-0108

Jefferson City, Missouri
June 2021

REBUTTAL TESTIMONY

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SPIRE MISSOURI INC., d/b/a SPIRE

SPIRE EAST and SPIRE WEST
GENERAL RATE CASE

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Q. Please state your name and business address.

A. Claire M. Eubanks, and my business address is Missouri Public Service Commission, P. O. Box 360, Jefferson City, Missouri, 65102.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission ("Commission") as Engineer Manager of the Engineering Analysis Department, Industry Analysis Division.

Q. Please describe your work and educational background.

A. A copy of my work and educational experience is attached to this testimony as Schedule CME-r1.

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my Rebuttal Testimony is to respond to Spire witness Michelle Antrainer regarding the Company's proposed Automated Meter Reading Opt-out Tariff.

Q. Please briefly describe the Company's Automated Meter Reading Opt-out tariff.

A. The Company's Automated Meter Reading Opt-out tariff will allow customers to opt-out of using an automated meter reading device. These customers would pay an initial one-time meter setup fee of $185 and a $40 monthly non-standard meter read charge.

Q. Do other utilities allow customers to opt-out of non-standard meters?

A. Yes. Several electric and water utilities regulated by this Commission allow customers to opt-out of advanced meters. The table below is a non-exhaustive summary of other advanced meter opt-out rates:

Utility	One-time fee	Monthly fee	Tariff Reference	Effective Date	Case
Evergy Missouri West	$150	$45	R-33.2	12/6/2018	ER-2016-0156 Non-unanimous Stip.
Ameren Missouri	$100	$40	Sheet No. 63 Sheet No. 129	2/19/2021 4/1/2020	EE-2019-0382; ER-2019-0335
Empire District Electric	$150	$45 $10 (for additional meters)	Section 5, Sheet 11 & Section 3, Sheet 5	8/17/2020 9/16/2020	ER-2019-0374, AO-2020-0237
Empire Water	$150	$45 $10 (for additional meters)	Section 2, Sheet 6; Section 1, Sheet 3	10/11/2020	AO-2020-0237
Liberty Utilities (Missouri Water)	$150	$45 $10 (for additional meters)	Sheet 5, Sheet 20	9/10/2020	AO-2020-0237

Note: Empire District Electric, Empire District Water, & Liberty Water tariffs include an additional option of disabling two-way communications. Also, a customer who opts out prior to installation is not assessed the one-time fee.

Q. Spire proposed a higher one-time fee and lower monthly fee than other utilities is that reasonable?

A. Yes. Spire provided a cost estimate supporting the one-time fee of $185 and the $40 per month monthly fee. The one-time set-up fee is based on the material costs to set a diaphragm meter, labor, and overhead.

The $40 monthly fee is based on the average time spent to read a meter. The Company assumed that a manual meter read may take incrementally longer than a read taken remotely from a technician's vehicle.

Q. If a customer requests to opt-out of a meter replacement will the one-time fee apply?

A. Spire indicated in response to Staff Data Request No. 0286 (Schedule CME-r2) that it intends only to apply the meter setup charge in instances where the Company incurs additional expense related to the customer's decision to opt out of the standard metering equipment. However, the tariff does not clearly state this provision. Therefore, I recommend the following language be included in compliance tariffs:

> Customers requesting non-standard metering service after initial advanced meter installation will be charged the One-Time Meter Setup Charge per meter. For all customers requesting non-standard metering service, the Non-Standard Meter Reading Monthly Charge will apply.

Q. Is Spire notifying customers before meter replacement?

A. At the June 9th, 2021 technical conference Spire indicated that it is not currently notifying the affected customer prior to installation of an advanced meter. Spire is primarily upgrading meters when an aged meter is due to be sampled or when re-establishing service.[1] Staff recommends that Spire implement a process to notify customers prior to installation of an advanced meter.

Q. Do you recommend any further clarifications to the tariff?

A. Yes. Spire should define its standard and non-standard metering equipment in its compliance tariff for Spire East and Spire West.

Q. Does this conclude your rebuttal testimony?

A. Yes.

[1] Response to Staff Data Request No. 0293 (Schedule CME-r3).

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Spire Missouri Inc.'s d/b/a Spire Request for Authority to Implement a General Rate Increase for Natural Gas Service Provided in the Company's Missouri Service Areas	)))))	Case No. GR-2021-0108

AFFIDAVIT OF CLAIRE M. EUBANKS, PE

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

COMES NOW CLAIRE M. EUBANKS, PE and on her oath declares that she is of sound mind and lawful age; that she contributed to the foregoing *Rebuttal Testimony of Claire M. Eubanks, PE*; and that the same is true and correct according to her best knowledge and belief.

Further the Affiant sayeth not.

Claire M Eubanks
CLAIRE M. EUBANKS, PE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 17th day of June 2021.

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

D Suzie Mankin
Notary Public

CLAIRE M. EUBANKS, PE

PRESENT POSITION:

I am the Manager of the Engineering Analysis Department, Industry Analysis Division of the Missouri Public Service Commission.

EDUCATIONAL BACKGROUND AND WORK EXPERIENCE:

I received my Bachelor of Science degree in Environmental Engineering from the University of Missouri – Rolla, now Missouri University of Science and Technology, in May 2006. I am a licensed professional engineer in the states of Missouri and Arkansas. Immediately after graduating from UMR, I began my career with Aquaterra Environmental Solutions, Inc., now SCS Aquaterra, an engineering consulting firm based in Overland Park, Kansas. During my time with Aquaterra, I worked on various engineering projects related to the design, construction oversight, and environmental compliance of solid waste landfills. I began my employment with the Commission in November 2012 and was promoted to my current position in April 2020.

CASE HISTORY:

Case Number	Utility	Type	Issue
EA-2012-0281	Ameren	Rebuttal	Certificate of Convenience and Necessity
EC-2013-0379 EC-2013-0380	KCP&L KCP&L GMO	Rebuttal	RES Compliance
EO-2013-0458	Empire	Memorandum	RES Compliance Plan & Report
EO-2013-0462	Ameren	Memorandum	RES Compliance Report
EO-2013-0503	Ameren	Memorandum	RES Compliance Plan
EO-2013-0504	KCPL	Memorandum	RES Compliance Plan & Report
EO-2013-0505	GMO	Memorandum	RES Compliance Plan & Report
ET-2014-0059	KCP&L GMO	Rebuttal	RES Retail Rate Impact
ET-2014-0071	KCP&L	Rebuttal	RES Retail Rate Impact
ET-2014-0085	Ameren	Rebuttal	RES Retail Rate Impact
ER-2014-0258	Ameren	Cost of Service Report, Surrebuttal	RES, In-Service

Case Number	Utility	Type	Issue
EO-2014-0151	KCP&L GMO	Memorandum	RESRAM
EO-2014-0357	Electric	Memorandum	Solar Rebates Payments
EO-2014-0287	KCPL	Memorandum	RES Compliance Plan
EO-2014-0288	GMO	Memorandum	RES Compliance Plan
EO-2014-0289	KCPL	Memorandum	RES Compliance Report
EO-2014-0290	GMO	Memorandum	RES Compliance Plan
ER-2014-0370	KCP&L	Cost of Service Report	RES
EX-2014-0352	N/A	Live Comments	RES rulemaking
EC-2015-0155	GMO	Memorandum	Solar Rebate Complaint
EO-2015-0260	Empire	Memorandum	RES Compliance Plan & Report
EO-2015-0263	KCPL	Memorandum	RES Compliance Report
EO-2015-0264	GMO	Memorandum	RES Compliance Report
EO-2015-0265	KCPL	Memorandum	RES Compliance Plan
EO-2015-0266	GMO	Memorandum	RES Compliance Plan
EO-2015-0267	Ameren	Memorandum	RES Compliance Plan & Report
EO-2015-0252	GMO	Staff Report	Integrated Resource Plan – Renewable Energy Standard
EO-2015-0254	KCPL	Staff Report	Integrated Resource Plan – Renewable Energy Standard
EA-2015-0256	KCP&L GMO	Live Testimony	Greenwood Solar CCN
EO-2015-0279	Empire	Memorandum	RES Compliance Plan & Report
ET-2016-0185	KCP&L	Memorandum	Solar Rebate Tariff Suspension
EO-2016-0280	KCPL	Memorandum	RES Compliance Report
EO-2016-0281	GMO	Memorandum	RES Compliance Report
EO-2016-0282	KCPL	Memorandum	RES Compliance Plan
EO-2016-0283	GMO	Memorandum	RES Compliance Plan
EO-2016-0284	Ameren	Memorandum	RES Compliance Plan & Report
ER-2016-0023	Empire	Report	RES
ER-2016-0156	KCP&L GMO	Rebuttal	RESRAM Prudence Review

Case Number	Utility	Type	Issue
EA-2016-0208	Ameren	Rebuttal	Certificate of Convenience and Necessity
ER-2016-0285	KCPL	Cost of Service Report	In-Service, Greenwood Solar
ER-2016-0179	Ameren	Rebuttal	In-Service, Labadie Landfill
EW-2017-0245	Electric	Report	Working Case on Emerging Issues in Utility Regulation
EO-2017-0268	Ameren	Memorandum	RES Compliance Plan & Report
EO-2017-0269	KCPL	Memorandum	RES Compliance Report
EO-2017-0271	KCPL	Memorandum	RES Compliance Plan
GR-2017-0215 & GR-2017-0216	Spire	Rebuttal & Surrebuttal	CHP for Critical Infrastructure
GR-2018-0013	Liberty Utilities (Midstates Natural Gas)	Rebuttal	CHP Outreach Initiative for Critical Infrastructure Resiliency
EO-2018-0287	Ameren	Memorandum	RES Compliance Plan & Report
EO-2018-0288	KCPL	Memorandum	RES Compliance Report
EO-2018-0290	KCPL	Memorandum	RES Compliance Plan
EA-2016-0207	Ameren	Memorandum	Certificate of Convenience and Necessity
ER-2018-0146	GMO	Cost of Service Report	RESRAM Prudence Review
ER-2018-0145 ER-2018-0146	KCPL GMO	Class Cost of Service Report, Rebuttal	Solar Subscription Pilot Rider, Standby Service Rider
EA-2018-0202	Ameren	Staff Report	Certificate of Convenience and Necessity
EE-2019-0076	Ameren	Memorandum	Variance Request – Reliability Reporting
EA-2019-0021	Ameren	Staff Report	Certificate of Convenience and Necessity
EA-2019-0010	Empire	Staff Report	Certificate of Convenience and Necessity
EX-2019-0050	N/A	Live Comments	Renewable Energy Standard

Case Number	Utility	Type	Issue
EO-2019-0315	KCPL	Memorandum in Response to Commission Questions	Renewable Energy Standard
EO-2019-0316	GMO	Memorandum	Renewable Energy Standard
EO-2019-0317	KCPL	Memorandum in Response to Commission Questions	Renewable Energy Standard
EO-2019-0318	GMO	Memorandum	Renewable Energy Standard
ER-2019-0335	Ameren	Cost of Service Report	Renewable Energy Standard, In-Service Criteria
EA-2019-0371	Ameren	Staff Report	Certificate of Convenience and Necessity
EO-2020-0329	Evergy Missouri Metro	Memorandum	Renewable Energy Standard
EO-2020-0330	Evergy Missouri West	Memorandum	Renewable Energy Standard
EE-2021-0237	Evergy Missouri Metro	Memorandum	Cogeneration Tariff
EE-2021-0238	Evergy Missouri West	Memorandum	Cogeneration Tariff
EE-2021-0180	Ameren Missouri	Memorandum	Electric Meter Variance
ET-2021-0151 and 0269	Evergy	Memorandum	Transportation Electrification
AO-2021-0264	Various	Staff Report	February 2021 Cold Weather Event
EO-2021-0339	Evergy Missouri West	Memorandum	Territorial Agreement

Spire Missouri
GR-2021-0108

Response to Staff Data Request 0286

Question:

1) Provide all workpapers and assumptions supporting the One-Time Meter Set-Up Charge of $185 and Non-Standard Meter Reading Monthly Charge of $40.

2) What meter type is considered to be the company's standard meter? Provide specification sheets.

3) What meter type will the company use when a customer requests a non-standard meter? Provide specification sheets.

4) If a customer opts-out prior to installation of remotely read metering equipment, does the $185 meter set-up charge apply?

DR requested by Claire Eubanks (Claire.eubanks@psc.mo.gov).

Response:

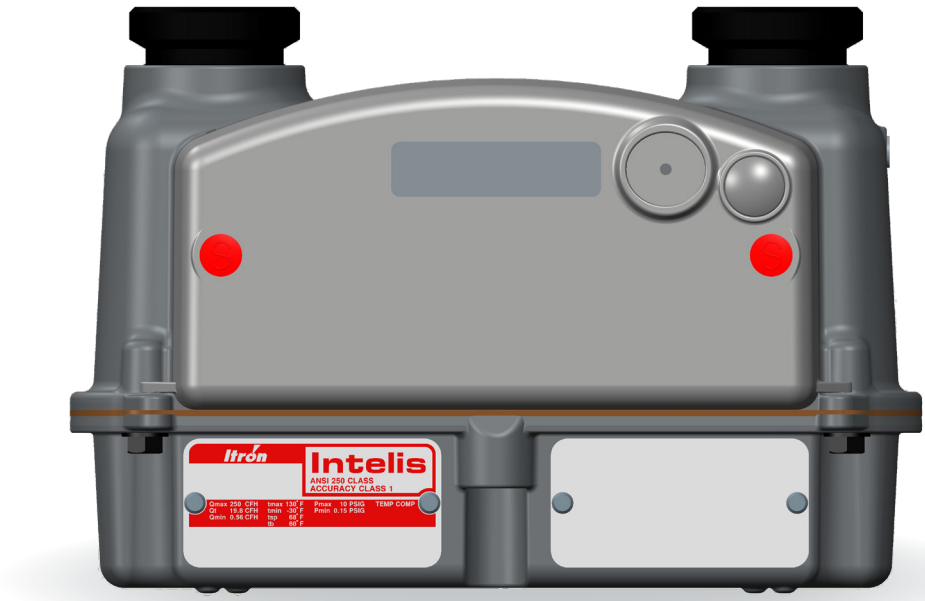
1) Please see Spire's repsonse to Data Request 243 for Miscellaneous Charges file calculation.

2) The Spire standard for residential metering is the ultrasonic meter. The ultrasonic meter is electronic and the RF module is integrated. Please see the attached specification sheet for this meter.

3) If someone opts out, Spire will install a diaphragm meter with a mechanical index. This technology requires a manual meter read every month from the index. Please see the attached specification sheet.

4) Spire would only apply the meter set-up charge if the Company incurs additional expense related to the customer's decision to opt out of the standard metering equipment.

Signed by: Michelle Antrainer



OpenWay® Riva Intelis Gas Meter

Transforming Gas Measurement

Itron has been assisting utilities since 2009, delivering hourly interval data in gas modules that has shed light on the granular flow rate for 40 days leading up to an incident. Given advances in solid state metering and the integration of RF (radio frequency) directly into the meter, Itron is now able to offer an exceptionally compact and feature rich solid state residential gas meter with an internal shut-off valve on the outlet of the meter. OpenWay Riva® Intelis Gas Meter combines multiple products in one unique, compact package delivering smart metering with temperature sensing + 500G communication device + shut-off valve

At only about **4 ½ pounds**, OpenWay Riva Intelis Gas Meter is the lightest 250 cubic feet per hour (CFH) residential gas meter available on the North American market. Intelis has 6” center-to-center hub connections so field retrofits may be easily accomplished. OpenWay Riva 500G ERT Module can be programmed to OpenWay Riva Network Mode or programmed to 100G DLS mobile mode to operate in fixed network or AMI environments. In addition, OpenWay Riva Intelis is equipped with an internal shut-off valve that functions similar to an excess flow valve downstream of the meter. This meter delivers distributed intelligence to gas metering by providing the ability to self-monitor and shut off the flow of gas during a high flow incident, independent of operator involvement or the RF reading topology. Leveraging OpenWay Riva Intelis as part of a smart gas communication platform enables utilities to automatically make intelligent decisions across the gas distribution network, delivering opportunities for operational savings and enhanced customer and employee safety by potentially preventing an explosion.

Key Features

- Compact size
- Integrated shut-off valve and high flow alarm
- Ultrasonic technology
- Embedded Openway Riva 500G ERT module
- Accuracy and long-term stability

SPECIFICATIONS

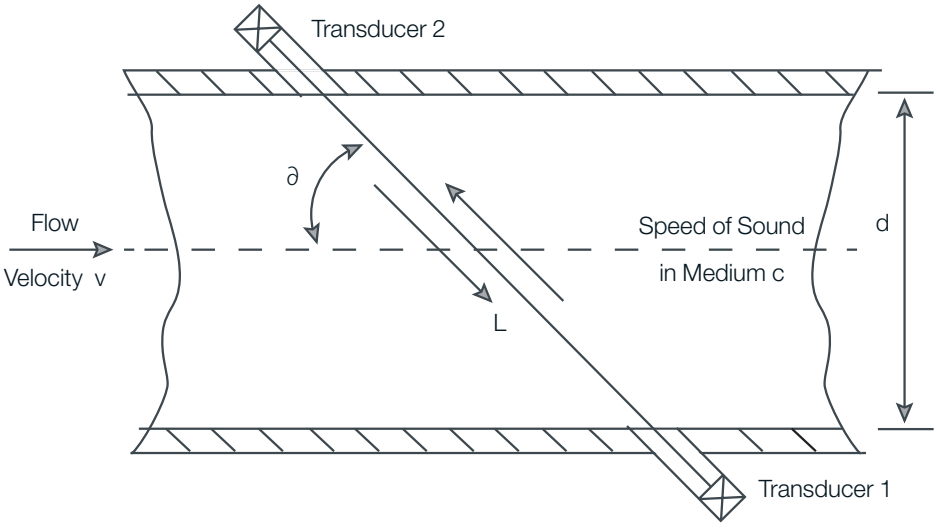
ULTRASONIC MEASUREMENT TECHNOLOGY

Ultrasonic Measurement Principle

Ultrasonic meters are considered newer technology, but have been around for many years. They were first introduced in 1963 by the company, Tokyo Keiki, then studied and developed more extensively in the 1970's by others. Technology advancements have made them more affordable for the residential market. Europe and Asia are leading the residential static installations, in 2017, the shipments are comparable to what is currently shipped in North America of diaphragm meters in the 2 to 2.5 million range. There are two types of ultrasonic measurement methods including time of flight (also known as transit time) and doppler shift, however doppler shift is not common in residential natural gas applications. Time of flight single path utilizes two transducers, one is upstream and one downstream of the gas flow. One transducer will emit an ultrasonic pulse and the other will sense it, then the process will reverse. The difference in time for the ultrasonic pulses to travel upstream versus downstream and the length between them is used to determine the velocity. The flow rate is then calculated from the velocity and the cross-sectional area. The pulse takes shorter time to travel in the direction of gas flow and longer against it. At no flow conditions, the transit time is the same in the upstream and downstream directions.

Benefits of Ultrasonic

The benefits of ultrasonic compared to diaphragm meters are first and foremost the compact size. Ultrasonic technology requires less of a footprint than similar capacity for diaphragm meter technology. There are no moving parts within an ultrasonic meter, therefore it is highly unlikely to lock-up due to contamination or freeze-ups within the gas stream. Another advantage is the accuracy and long-term stability. The initial accuracy can be precisely calibrated. Since there are no moving parts the meter is less likely to drift over time. Given ultrasonic meters are electronic most are capable of on-board self-diagnostics.



Transducer 1 = downstream transducer

Transducer 2 = upstream transducer

L = length of measurement chamber distance between transducers

t1 = time from transducer 2 → 1

t2 = time from transducer 1 → 2

v = velocity

$$v = \frac{L}{2 * (\cos \partial)} * \frac{(t1 - t2)}{(t1 * t2)}$$

Volume = flow rate * time

Ultrasonic single path with two transducers

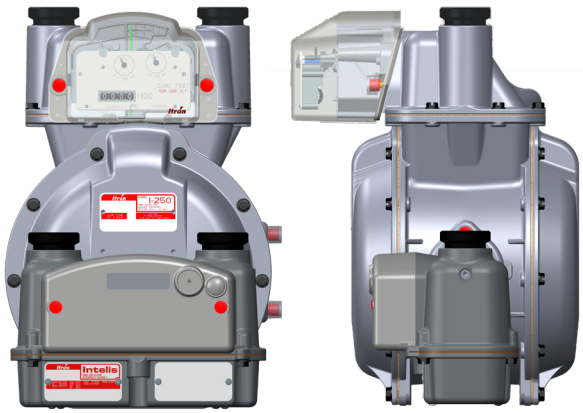
OPENWAY RIVA INTELIS GAS METER FEATURES

A safety feature with a ***high flow alarm*** and an ***integrated valve*** that acts similar to an excess flow valve. With an internal high flow alarm that is configurable by the utility, a threshold can be set in the meter indicative of an open fuel line downstream of the meter. This high flow event automatically triggers the shut-off valve to close, potentially preventing an explosion and property damage or even loss of life. This safety feature is a key demonstration of intelligence at the meter and will work in both OpenWay Riva Network Mode or 100G DLS mobile mode. It is mandatory to be on-site at the meter to re-open the valve to ensure safe conditions.

An ***air detection alarm*** can be triggered notifying the utility that air was detected in the meter. This can be used for potential tampering information, for example if the meter was removed from installation.

Reverse flow detection function will determine if gas is flowing from the outlet to inlet instead of in standard operating mode which is from inlet to outlet. An alarm will be logged and this can be used for potential tampering information.

A ***high temperature alarm*** can be utilized to notify of a potential fire or other dangerous conditions and can automatically trigger the shut-off valve to close, potentially preventing an explosion and property damage or even loss of life.



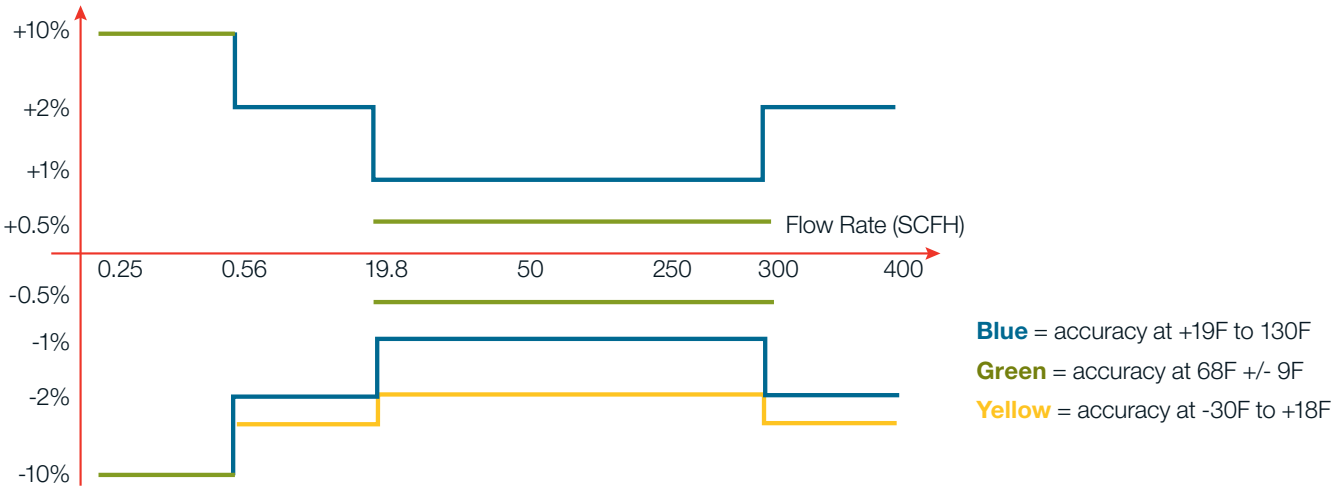
OpenWay Riva Intelis Gas Meter is an impressive 70% size reduction of the I-250 diaphragm meter.

The ***OpenWay Riva 500G ERT module*** is an IPv6 open standards based gas module that offers the most flexibility in RF reading options of any Itron gas module. It is designed to be read under Itron's OpenWay Riva multi-purpose Internet of Things (IoT) network or by legacy ChoiceConnect handheld, mobile and fixed network readers. With new features for IoT operation like firmware download, sub hourly interval data and extended data storage, Itron's OpenWay Riva 500G ERT module offers additional value while continuing to offer the highest in reliability, accuracy, battery life, security standards and intrinsic safety that you have come to expect from the industry leader in gas modules.

This smart meter features on-board ***self-diagnostics*** including monitoring of transducers aging, remaining battery capacity and gas temperature.

Itron continues its long-standing tradition of superb battery life performance. The entire meter package will have a ***20-year battery life*** including the meter, 500G and valve when using recommended parameters.

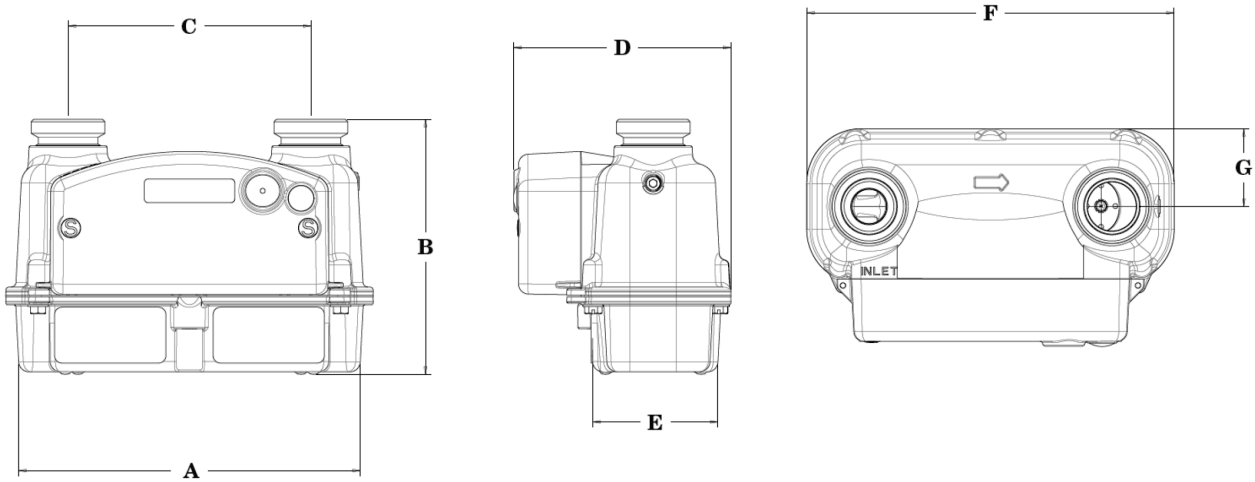
The ***accuracy*** of OpenWay Riva Intelis is designed to meet ANSI B109.1 as well as Class 1 according to draft ANSI B109.0 and Measurement Canada PS-G-06. In addition, Intelis will achieve +/- 0.5% at room temperature from 19.8-300 SCFH.



The ***accuracy*** of OpenWay Riva Intelis Gas Meter is a class 1. Specifically this is +/- 1% from 19.8 cfh to 300 cfh from +19F to +130F. In addition, it will achieve +/- 0.5% at room temperature.

DIMENSIONS (INCHES)

Model	A	B	C	D	E	F	G
OpenWay Riva Intelis	8.44	6.29	6.00	5.36	3.09	9.08	1.92



All dimensions are aproximate

SPECIFICATIONS

Meter Capacity	250 cubic feet per hour
Measurement Principle	Ultrasonic time of flight
Gas Type	Natural Gas
Hub Center-to-Center	6”
Hub Size Options	10LT, 20LT, 30LT, 1A/Standard, 1 ¼”
Meter MAOP	5 PSIG
Meter Type	TC (Temperature compensated) or NTC (Non-Temperature compensated)
Intrinsically Safe	UL Class I, Division 1
LCD Displayed Units	CCF (100 x cubic foot) or cubic meter
LCD Resolution	0.001 CCF (0.1 CF) or 0.001 m3
Accuracy	Class 1 and +/- 0.5% at room temperature
Case	Aluminum case with gray powder coat finish
Valve	Gate valve, maximum 0.035 CFH leakage rate (14% of pilot flow)
Battery Information	4 Lithium Manganese Dioxide (LiMnO2) ‘A’ cell batteries, replaceable
Battery Life	20 years for meter, 500G and valve using recommended parameters
Pressure Tap	Pipe plug pressure tap standard on outlet of meter
Badging	Standard aluminum manufacturing and optional customer badge

Additional Information

500G specifications sheet: 101510SP
OpenWay Riva specifications sheet: 101493MP

Join us in creating a more **resourceful world**.
To learn more visit **itron.com**

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Liberty Lake, WA 99019 USA
Phone: 1.800.635.5461
Fax: 1.509.891.3355

I-250

Residential and Light Commercial Gas Diaphragm Meter

Growing demand for natural gas necessitates a renewed focus on precision in measuring consumption. The Itron I-250 gas diaphragm meter offers exceptional accuracy and reliability for enhanced revenue assurance. Improving on a long-trusted design, the I-250 is a positive displacement measurement device with proven performance. A classic returns.

Accurate. Reliable.

To effectively protect utility revenues, metering data must reflect actual consumption. The I-250 meter measurement performance stems from its accuracy over a wide range of flow rates and in a variety of harsh weather conditions, the result of a simple three-chamber design with comparably few moving parts. Fewer wear points also result in simplified maintenance and longer meter life for greater dependability.

Proven. Trusted.

The new I-250 meter design leverages decades of field-proven use and improvements and is now built with innovative production methods, incorporating the best of today's robust materials, making it one of the premium residential and light commercial meters available today. A longstanding reputation for performance and quality affords the new I-250 meter a well-deserved level of credibility.

Benefits

- Accuracy over wide range of gas flow rates
- Ease of maintenance
- Interchangeable parts
- Ease of installation

KEY FEATURES

Each of these features contributes to increased accuracy and longer life with less maintenance.

- Design simplicity
- Wearless orbital valve
- Lubrication-free bearings
- Easy adjustment

OTHER FEATURES

- Three-chamber design
- One-piece seamless diaphragm
- EZ-VU adjustment port
- AMR/AMI compatible

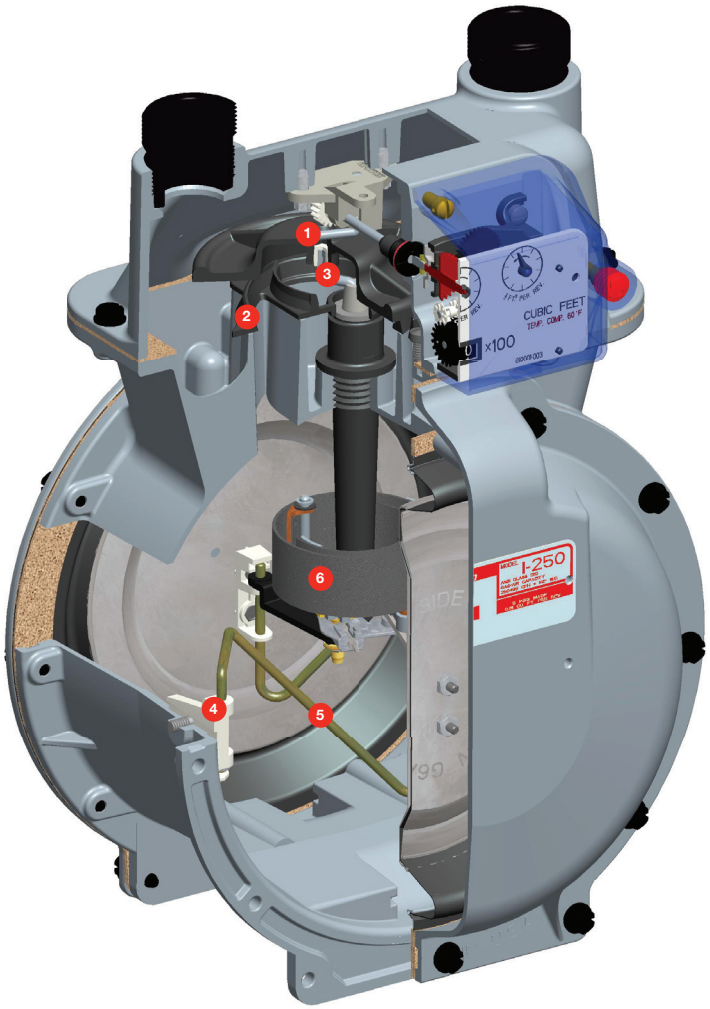
Meets applicable standards

- ANSI B109.1

SPECIFICATIONS

Design Simplicity

The accompanying photo shows the inherent simplicity of the Itron three-chamber design: one valve seat, one valve cover, one main shaft and one tangent crank. Itron gas meters contain fewer critical links, rods, bearings and other moving parts.



CONSTRUCTION

Component	Material
Top Casting, Side Castings, Center Casting	Die Cast Aluminum
Gaskets	Cork/Neoprene
Valve Cover / Seat	Phenolic
Main Shaft, IDM shaft, Flag Shaft	Stainless Steel
IDM Housing	Nylon
Boot Seal	Nitrile
Diaphragm	Nitrile Rubber
Diaphragm Plate (Center)	Aluminum
Diaphragm Plate (Side Cover)	Tin
Carrier Wire	Zinc Plated Steel
Center Bracket	Nylon - Glass Filled
O-Rings	Nitrile
Handhole Cover	Stamped Steel
Displacement Adjustment Screw	Nickel Plated Steel
Timing Adjustment Screw	Brass
Index Driving Male Dog	Brass
Index Cover (w/ RTV)	Polycarbonate

1. **Hex bushing**
   - » In the valve cover to provide self alignment and ensure consistent orbiting of the valve cover
2. **Wearless orbital valve seat**
   - » Enables mainshaft and tangent crank to be replaced without removing the valve seat
3. **Mainshaft and tangent crank**
   - » One-piece construction minimizing assembly variations
4. **Lubrication-Free bearings**
   - » Ensure long maintenance-free operation
5. **Carrier bracket**
   - » Engineered with tongue and groove design allowing for consistent and precise positioning of wires
6. **Temperature compensation (optional)**
   - » Located in the main measurement chamber for more prompt response to changes in temperature

SPECIFICATIONS

	I-250
Meter Capacity	250 CFH Natural Gas @ .5 inch w.c. Differential 400 CFH Natural Gas @ 1.0 inch w.c. Differential
Hub Center-to-Center	6”
Hub Sizes	1A Sprague Standard, 10 LT, 20 LT, 30 LT, 1-¼”
Meter Type	(TC) Temperature Compensated or (NTC) Non-Temperature Compensated
Units	Imperial (Cubic Feet - ft^3) or Metric (Cubic Meters - m^3)
Index Drive	2 ft^3/revolution or 50 cubic decimeters/revolution
Proving / Test Dials	ft^3 - ½’ and 2’ Proving Dials or m^3 - 10 dm^3 and 50 dm^3 Proving Dials
Tangent Crank	9 revolutions/ft^3 or .111 ft^3/revolution 3.2 revolutions/dm^3 or .31 liters/revolution
Indexes	4 Circle Dial (ft^3 - Standard Pressure, 2 PSIG) 4 Digit Direct Read (ft^3 - Standard Pressure) 5 Digit Direct Read (ft^3 or m^3 - Standard Pressure) Standard = 7 inches w.c.
Meter M.A.O.P.	5 PSIG (10 PSIG optional)
Meter Operating Temperature Range	-30°F to +120°F -34°C to +49°C
Surface Treatment	ASA 49 Gray Polyester Powder Coat

DIMENSIONS

Imperial - Inches

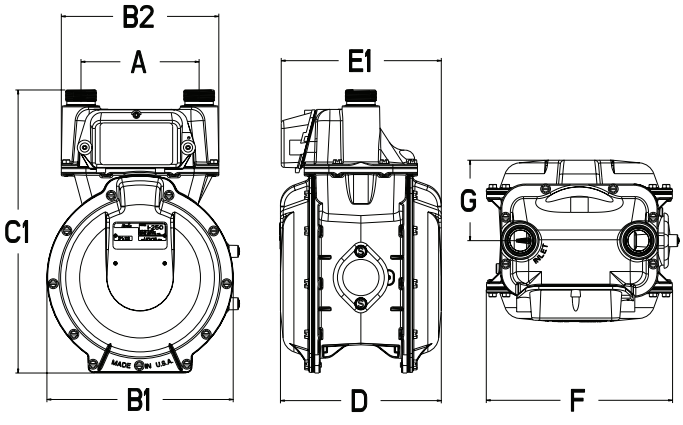
Model	A	B1	B2	C1	C2	D	E1	E2	F	G	Wt. (lbs)
I-250	6.0	9.5	8.0	14.4	–	8.2	8.1	–	9.5	4.1	9.5
I-250 with 100G	6.0	9.5	8.0	14.4	14.1	8.2	–	9.1	9.5	4.1	10.2

Metric – Millimeters

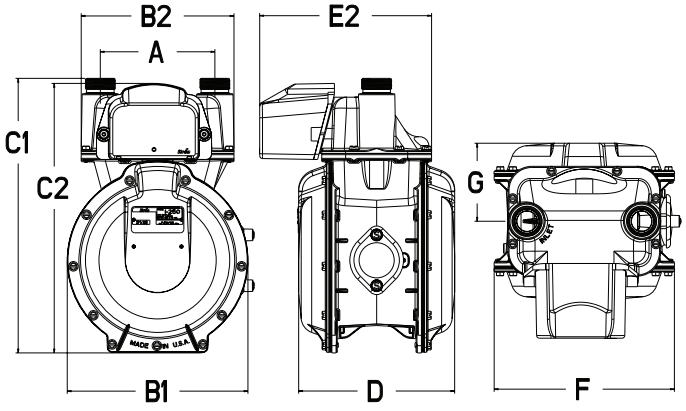
Model	A	B1	B2	C1	C2	D	E1	E2	F	G	Wt. (kg)
I-250	152	240	203	365	–	208	207	–	240	104	4.3
I-250 with 100G	152	240	203	365	358	208	–	231	240	104	4.6

All dimensions and weights provided are approximate

I-250



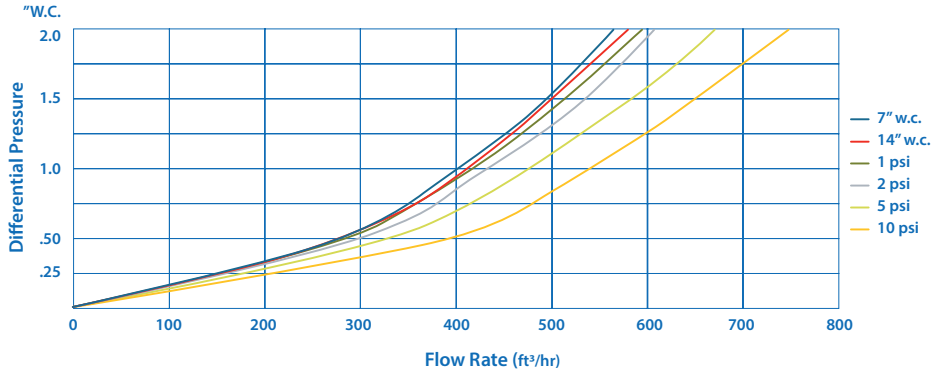
I-250 with 100G DLS Datalogging ERT® Module



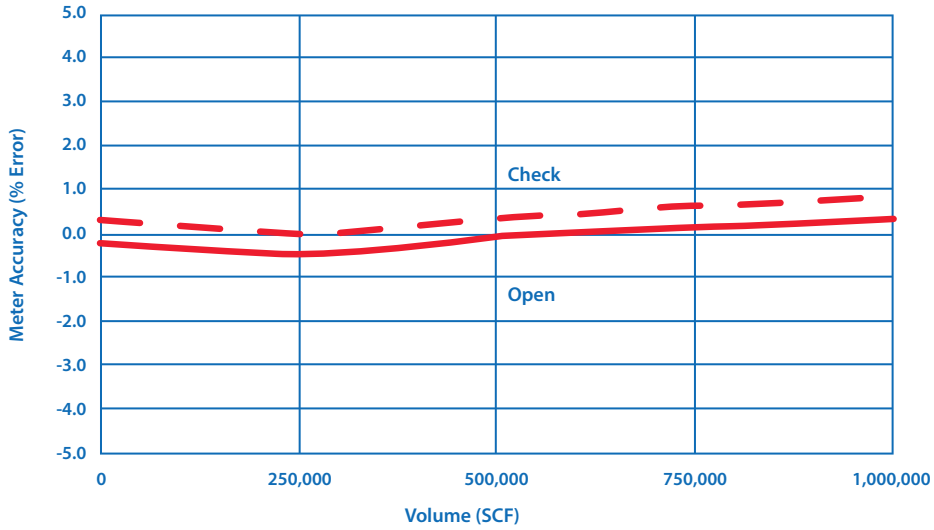
	Meters per Layer	Layers per Pallet	Meters per Pallet	Pallet Dimensions	Pallet Weight (lbs)
I-250	20	3	60	44” x 41” x 50”	670
I-250 with 100G	16	3	48	44” x 41” x 50”	604

All dimensions and weights provided are approximate

CAPACITY & PRESSURE LOSS*



ACCELERATED LIFE TEST*



*Individual meter performance may vary

AMR/AMI COMPATIBLE

The I-250 is compatible with leading AMR/AMI devices.

Shown with 100G DLS Datalogging ERT® Module

ADDITIONAL INFORMATION

- 3-Chamber Meter Adjustment (TDC-0848-XXX
- Diaphragm Type Gas Meters Installation Procedure (TDC-0841-XXX)
- Diaphragm Meter Product Line (TDC-0858-XXX)
- I-250 Parts List (TDC-1412-XXX)

**Use most current publication revision.

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Spire Missouri
GR-2021-0108

Response to Staff Data Request 0293

Does the Company have plans to retire its existing meters? If so, please provide copies of the plans, schedules, and yearly cost budgets/forecasts and any other supporting documents.

DR Requested Claire Eubanks (Claire.eubanks@psc.mo.gov)

Response:
Spire is retiring its existing meters in a fashion similar to what has historically been done with the sampling program. The tempo of this program is increasing as meters eligible for sample are being replaced when the customer opportunity is available. The current sampling program has a significant population of aged meters that can be targeted to accelerate the tempo of replacements. When a meter is off and customer service needs to be re-established, the meter is being replaced regardless of age. At this point, the change in the frequency of replacements has not been targeted to a level that has warranted an evaluation of the impact to the retirement of the meter plant in service. For Spire Missouri East if a replacement schedule is finalized that will have a material impact, such analysis will be performed.

Signed: Scott Weitzel