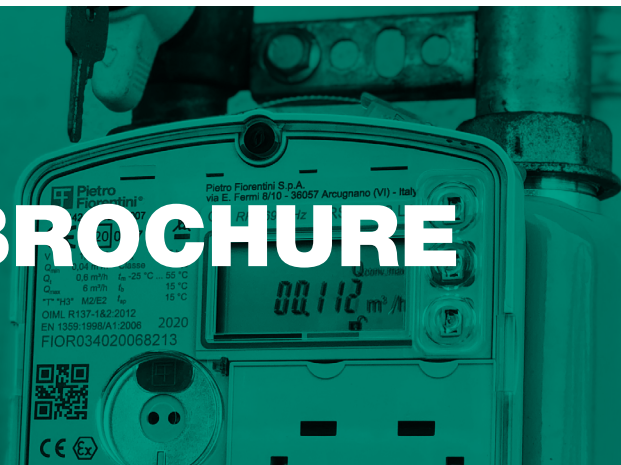


SSM-iCON 400

Residential metering



TECHNICAL BROCHURE



Pietro Fiorentini S.p.A.

Via E.Fermi, 8/10 | 36057 Arcugnano, Italy | +39 0444 968 511
sales@fiorentini.com

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Who we are

We are a global organization specialized in designing and manufacturing technologically advanced solutions for natural gas treatment, transmission and distribution systems.

We are the ideal partner for operators in the Oil & Gas sector, with a business offer that goes across the whole natural gas chain.

We are in constant evolution to meet our customers' highest expectations in terms of quality and reliability.

Our aim is to be a step ahead of the competition, with customized technologies and an after-sale service program undertaken with the highest grade of professionalism.



Pietro Fiorentini advantages



Localized technical support



Experience since 1940

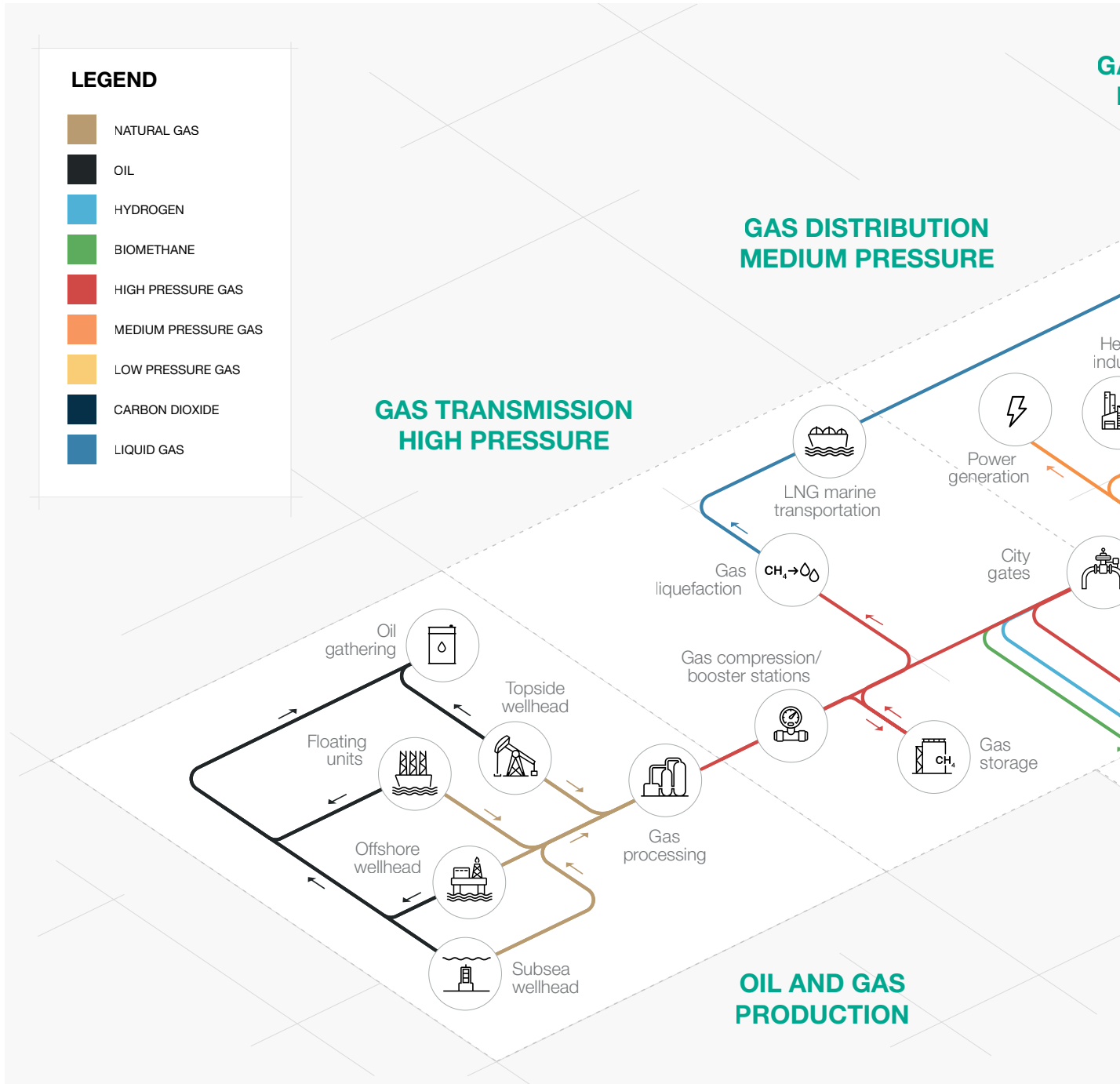


We operate in over 100 countries

Area of Application

LEGEND

- NATURAL GAS
- OIL
- HYDROGEN
- BIOMETHANE
- HIGH PRESSURE GAS
- MEDIUM PRESSURE GAS
- LOW PRESSURE GAS
- CARBON DIOXIDE
- LIQUID GAS



Green icon indicates the application where this product is suitable for

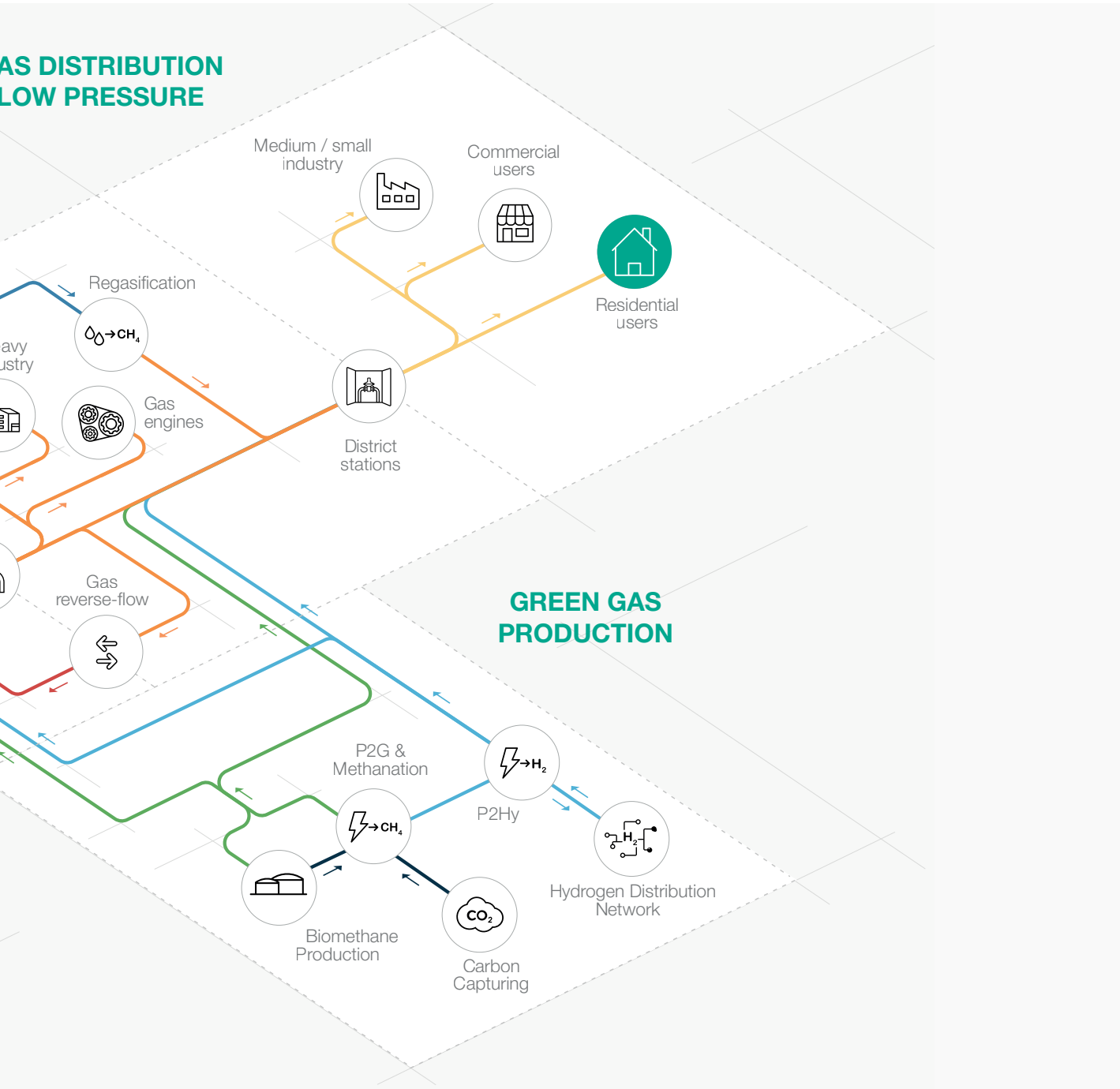


Figure 1 Area of Application Map

Introduction

SSM-iCON 400 is the natural evolution of the Pietro Fiorentini know-how and experience in the gas industry.

With its **ultrasonic technology** SSM-iCON 400 provides gas volume measurement.

This device is used in residential environment, for dry gas volume measurement.

The replaceable communication module allows the flexibility to change network in the field, either for technology evolutions or to leverage different communication networks options keeping the same meter asset.



Figure 2 SSM-iCON 400 with agnostic network communication module

Features

The SSM-iCON 400 smart meter by Pietro Fiorentini incorporates the latest ultrasonic measurement technology to the flexibility of the **multi communication module**.

Equipped with state-of-the-art monitoring sensors it can stop the gas flow for temperature (fire), pressure or seismic events as well as from remote, to enhance customers safety.

Suitable for use with **natural gas, biomethane** and hydrogen blends (up to 20%), this device is used for residential application on low pressure gas distribution networks.

High accuracy

Below a typical accuracy performance of SSM-iCON 400 ultrasonic smart gas meter measured with a maximum 1/2" water column pressure drop.

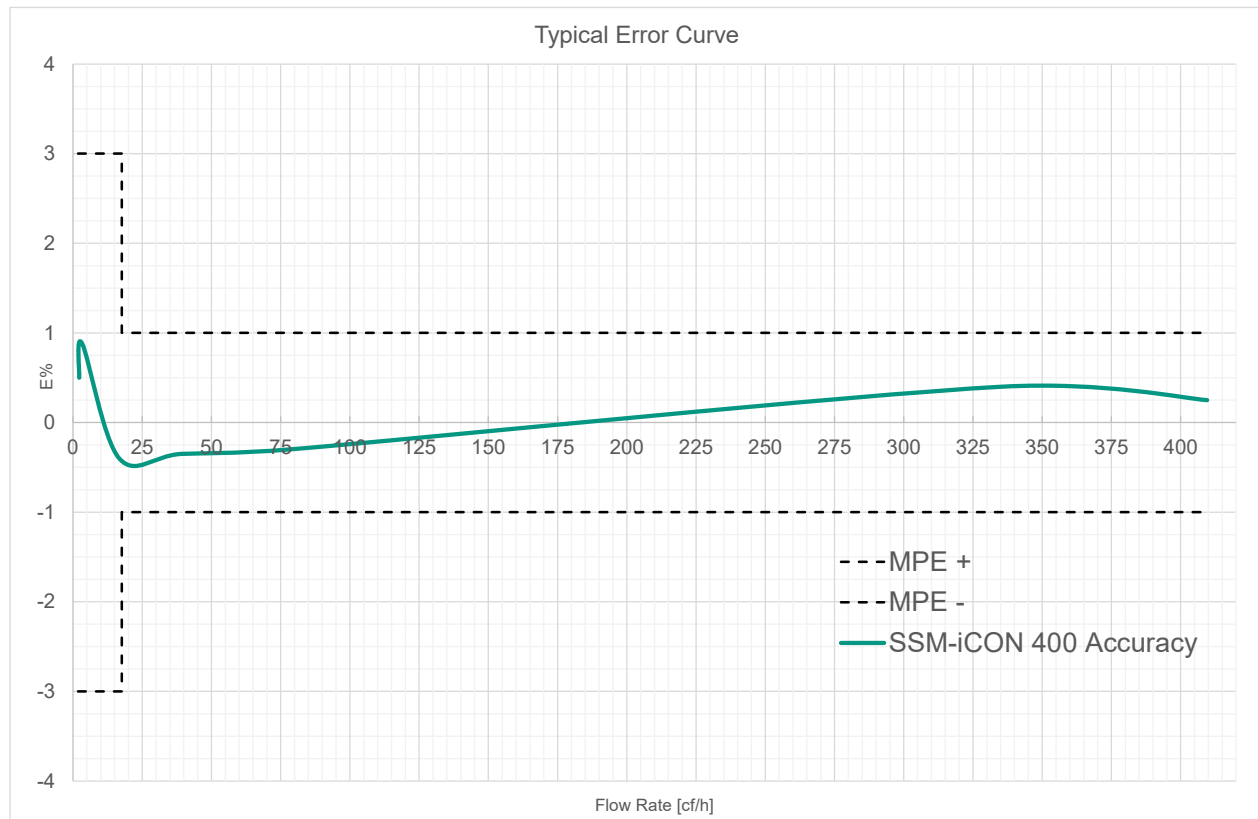


Figure 3 Typical error curve



Benefits of Ultrasonic Measurement Technology

Ultrasonic measurement is well known in the gas industry and applied in many areas for several decades, now.

In recent time static metering technology has arrived at the residential sector, offering the same measurement quality and service levels as for the industrial sector.

The ultrasonic measurement-based meters are offering many advantages over the diaphragm gas meters that make these meter competitive in the residential meter market.

Since these meters do not have any moving parts the maintenance requirement is very low. Thanks to its static design the meter resists more to dust and freezing temperature conditions.

Another significant benefit is the **high measurement accuracy**. These meters' small footprint enables to install them into tight spaces.

Simplified design

During User Experience and User Interface design it was the key driver was to give the user the best experience that interaction with a gas meter can give. With a **single button design** the most important parameters can be scrolled through with zero-latency.

The **large display is well readable** and has a high contrast to be able to read it during strong daylight conditions.











Features

Features	Values
Capacity	11.6 m ³ /h at 0.125 kPa differential pressure 410 cfh at 1/2" w.c. differential pressure
Measurement Range (Qmin - Qmax)	0.09 to 11.6 m ³ /h 3 to 410 cfh
Minimum Flow rate (Qstart)	0.03 m ³ /h 1 cfh
Maximum Operating Pressure*	up to 34.5 kPa up to 5 psig
Ambient temperature*	from -35°C to 55°C from -30°F to 130°F
Gas temperature range*	from -35°C to 55°C from -30°F to 130°F
Accuracy	Class 1 (according to ANSI B109.6)
Ingress protection	Compliant to IP67 and NEMA 4X
Power supplies and operating lifetime	Lithium batteries 20 years for metrological battery (non-replaceable) Up to 20 years for communication battery (replaceable)
Remote communication interface	Both NB-IoT and Cat-M1 in the same module
Hazardous area certification	Class 1 Division 1 Group D as per ANSI/ISA 121201
Gas volume compensation	Temperature compensated (TC) and non temperature compensated (NTC) options available
Nominal dimensions	Connection distance – 6" (152,4mm)
Connections	10LT, 20LT, 30LT, Sprague (other on request)

(* Note: Different functional features and/or extended temperature ranges available on request. Stated temperature ranges are the maximum for which the equipment's full performance, including accuracy, are fulfilled. Standard product may have a narrower range.

Table 1 Features

SSM-iCON 400 competitive advantages

- 
 Emergency gas shut off for fire event
- 
 Emergency gas shut off for earthquake
- 
 NB-IoT and Cat-M1 multi standard IoT modem
- 
 Advanced diagnostic with pressure and temperature monitoring sensors
- 
 Simple HMI with LCD display. Single button operation
- 
 20 years metrological battery
- 
 20 years communication battery life with NB-IoT module (both 4G and 5G networks)
- 
 Open protocol and interchangeable communication module
- 
 Suitable for outdoor installations
- 
 Biomethane compatible and 20% Hydrogen blending compatible. Higher blending available on request

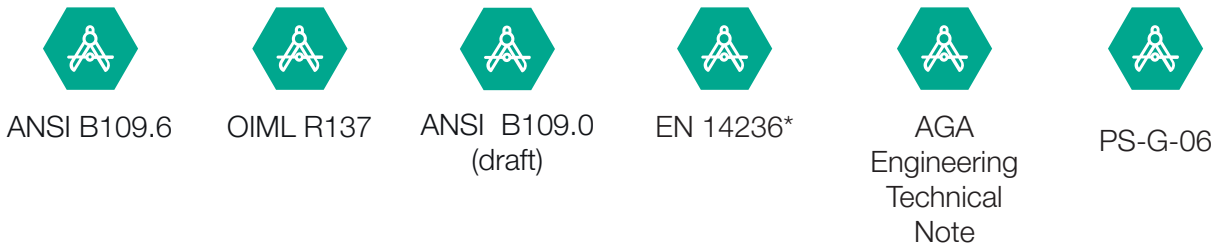
Materials and Approvals

Part	Material
Body	Die cast aluminum ANSI/AA 384.0 with epoxy finishing for the meter case
Electronic enclosure	Plastic polycarbonate for the electronics case suitable for outdoor installation

NOTE: The materials indicated above refer to the standard models. Different materials can be provided according to specific needs.

Table 2 Materials

The SSM-iCON 400 is designed to meet ANSI B109.6, AGA Ultrasonic Gas Meters Engineering Technical Note as well as key features compliance of OILM R137, ANSI B109.0 (draft), PS-G-06 and EN14236.



*Limited to “5.7 Contaminants in the gas stream”.

The product is certified cULus Class1 Div1 for Hazardous area installation.



cULus
Class1
Div1

Advanced safety

Emergency gas shut off for fire event

The SSM-iCON 400 is equipped with industrial graded environmental temperature sensor and has a **built-in intelligence** to monitor the temperature gradient. In case of a fire event in the proximity of the meter, the sensor detects the high temperature and if selected, shuts off the built-in valve, thus the gas flow is blocked and **can prevent feeding the fire**.

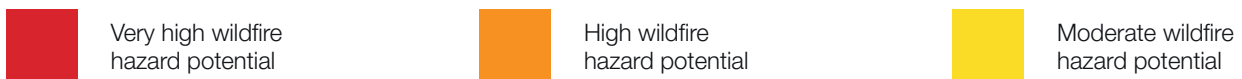
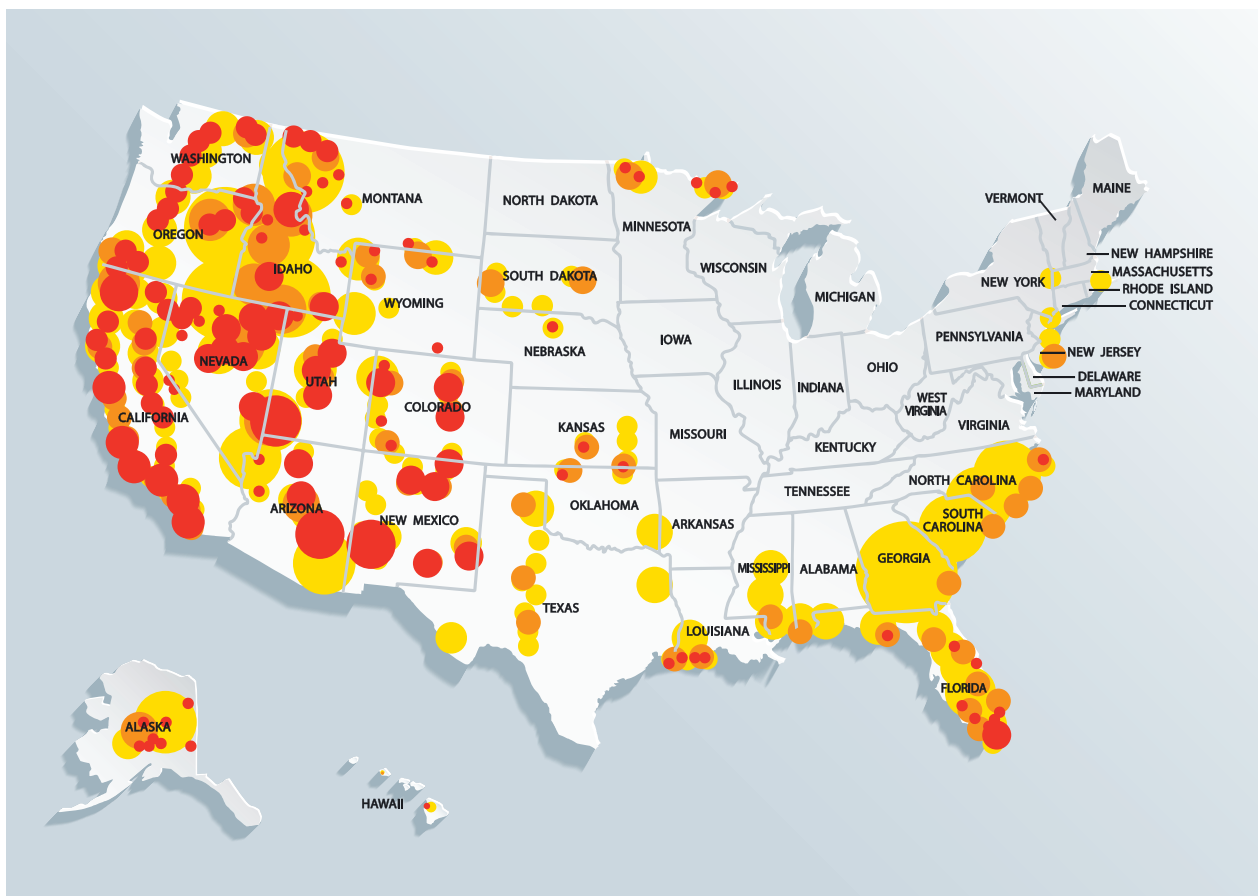


Figure 4 Wildfire Hazard Potential (2020)

Pressure and temperature monitoring sensor

The SSM-iCON 400 is equipped with temperature sensor to monitor the gas flow and help the conversion of the raw gas volume into standard conditions that will result into an **accurate compensated volume for consumption settlement**. Furthermore, the pressure sensor is monitoring the delivery pressure. If the monitored pressure indicates a service regulator delivery pressure anomaly the meter trigger an alarm.

Emergency gas shut off for earthquake

The SSM-iCON 400 is equipped with **industrial graded seismic sensor** and has a **built-in intelligence** to monitor the ground movement and determine if the amplitude of the seismic waves are reaching a certain level where the gas supply might be dangerous, so the meter, if the option is selected, shuts off the valve **preventing leakages, and lowering the risk of fire**.

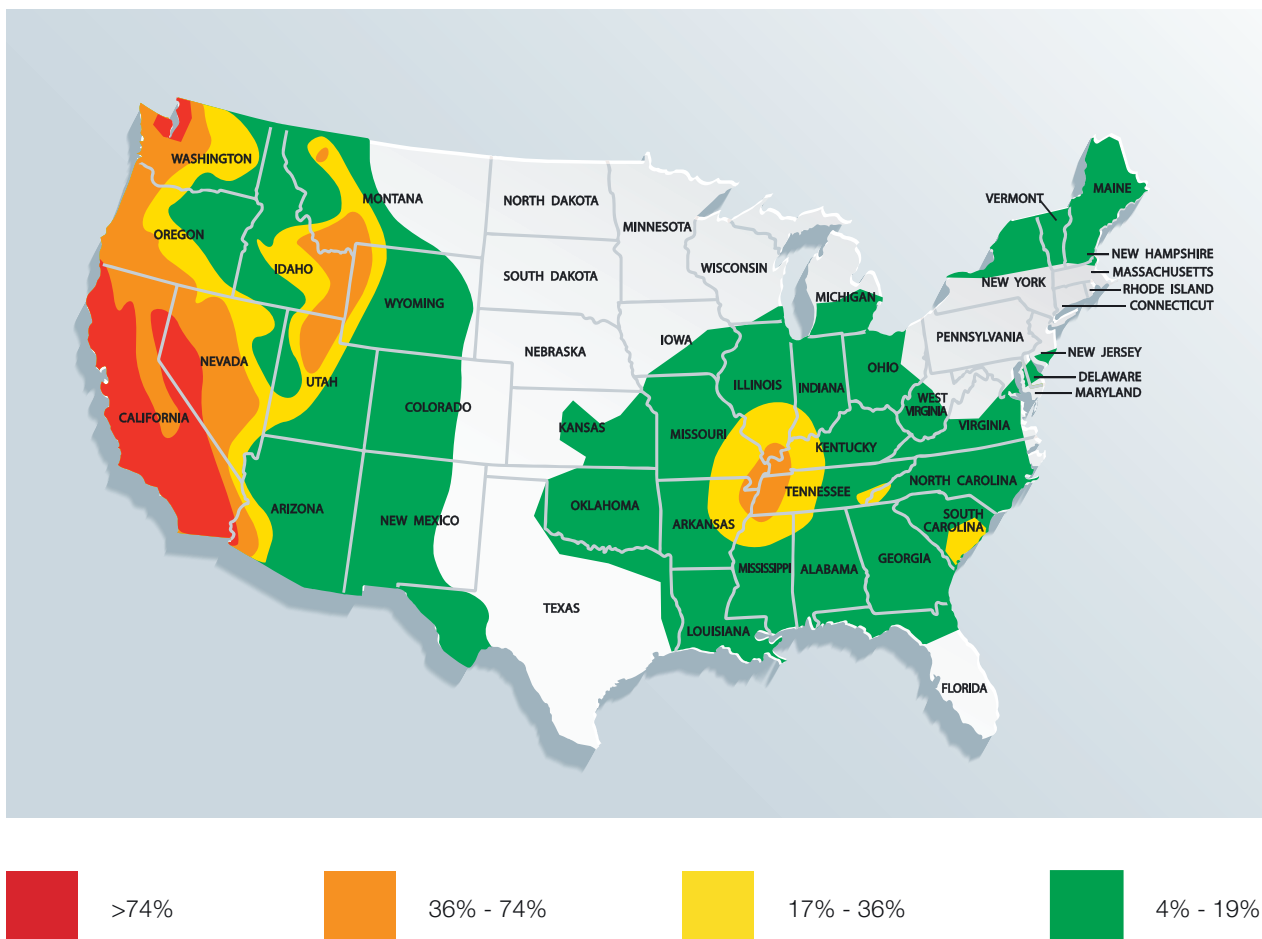


Figure 5 Chance of slight (or greater) damaging earthquake shaking in 100 years

Smart functionalities

Advanced diagnostic

The meter is capable to identify any sort of malfunction in the built-in sensors, or the telecommunication network or any other parts that are connected to the central processor. These **advanced self-diagnostic** features prevent the meter to perform in a failed state. It indicates the type of malfunction, sends alert to the gas utility (if possible), and stops the gas flow, if needed.

Built-in tamper monitoring

The SSM-iCON 400 is capable of **monitoring various tampering and fraud attempts**. These events are registered into the meter and transmitted immediately to the utility company MDM/SCADA system.

Communication & batteries

Advanced communication and longevity

The SSM-iCON 400 is equipped with the latest generation **NB-IoT/Cat-M1** (both 4G and 5G networks) communication modules to ensure **long-term compatibility** and maintain battery operation lifetime up to 20 years. The 4G communication technology is laying on the strong foundation of **3GPP international standards** that ensures back-to-back compatibility. The meter is equipped with **over the air firmware upgrade** function to ensure cyber security compliance through its operating lifetime.



Open protocol

The meter is using **DLMS protocol**, which is designed for the smart meter communication bringing **security, interoperability, efficiency**.

It is a globally accepted **non-proprietary open protocol** for smart metering applications, the ideal for fostering multivendor environment.

Versatility

Suitable for outdoor installation

The meter is designed to **resist harsh environmental conditions** in both indoor and outdoor installations. The high-level ingress protection prevents dust and water to penetrate the enclosure in all weather conditions.

Sustainability

The SSM-iCON 400 is compatible with **biomethane, hydrogen (up to 20%) and natural gas blends**. That positions this meter as a facilitator of the green gas / natural gas blend injection into the gas grid.

Weights and Dimensions

SSM-iCON 400

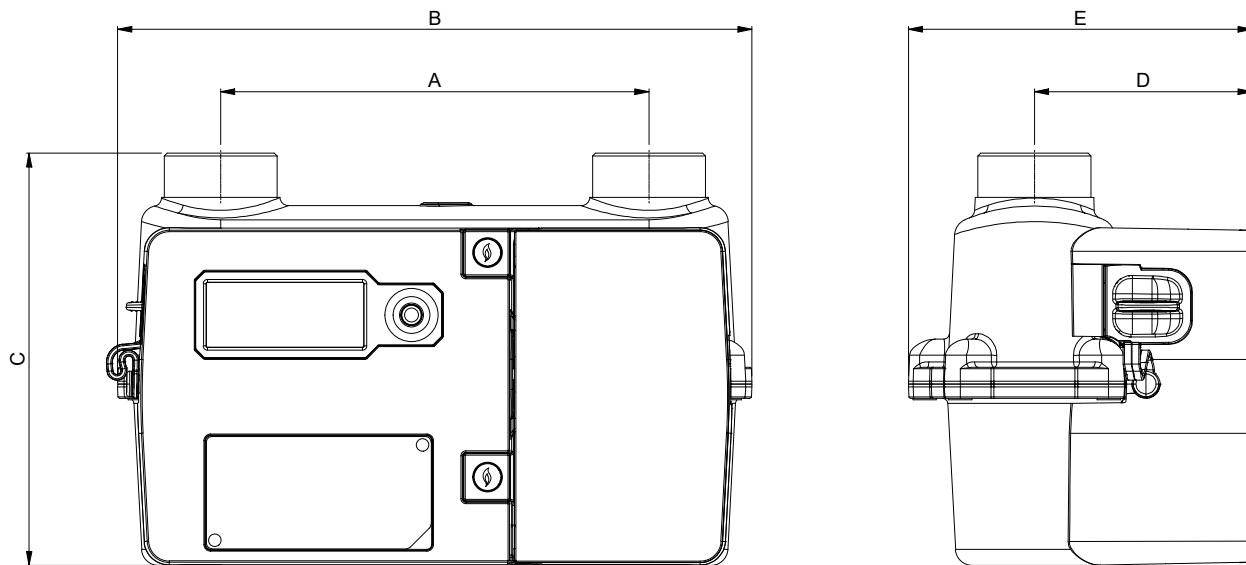
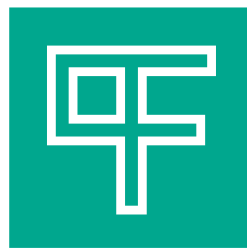


Figure 6 SSM-iCON 400 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)		
Model	250	
Connection distance - [mm]	152.4	
Connection distance - inches	6"	
	[mm]	inches
A	152.4	6"
B	225.7	8.89"
C	146.7	5.76"
D	77.5	3.06"
E	122.3	4.82"
Weight	kg	lbs
	1.9	4.2

Table 3 Weights and dimensions



Pietro Fiorentini

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