Pietro Fiorentini

SSM-iCON

Residential metering

TECHNICAL BROCHURE

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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.

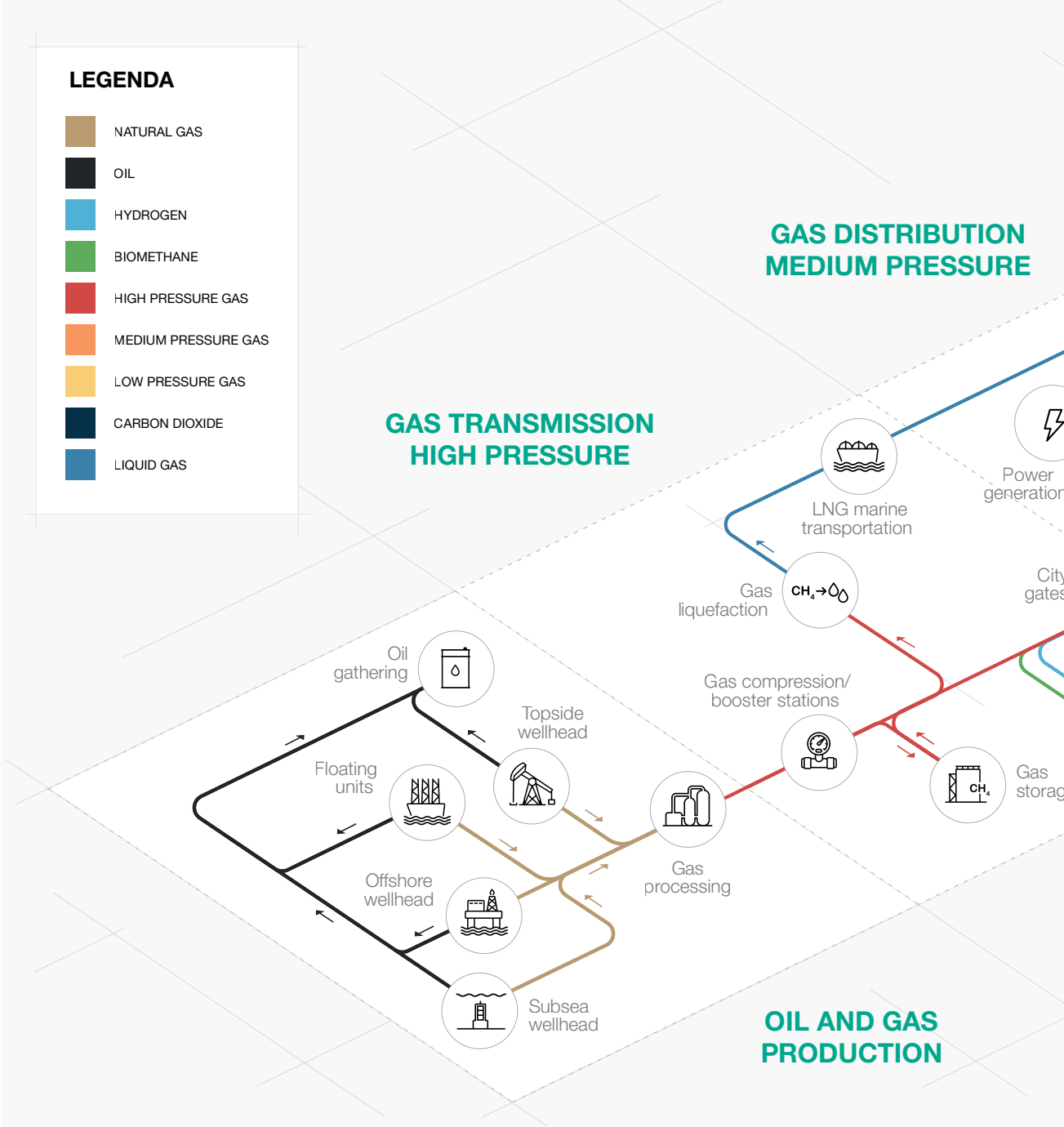
We are in constant evolution to meet our customers' highest expectations in terms of quality and reliability.

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

- Localised technical support
- Experience since 1940
- We operate in over 100 countries

Area of Application



Green icon indicates the application where this product is suitable for

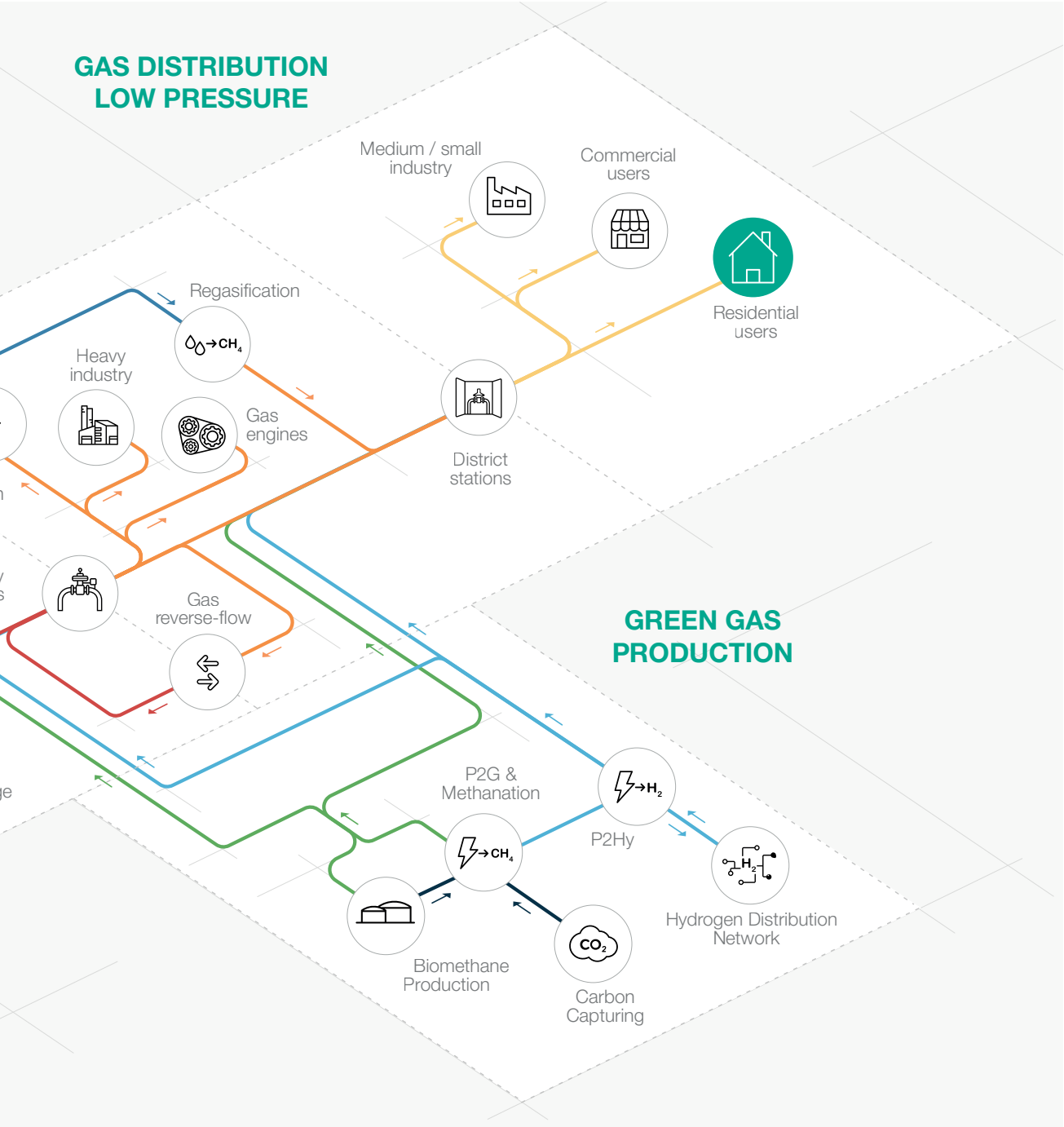


Figure 1 Area of application map

Introduction

SSM-iCON is the natural evolution of the Pietro Fiorentini know-how and experience in the gas industry.
With its **ultrasonic technology** SSM-iCON provides gas volume measurement.
This device is used in residential environment, for dry gas volume measurement.

Figure 2 SSM-iCON with built-in wireless communication module

Features

The SSM-iCON 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 ultrasonic smart gas meter.

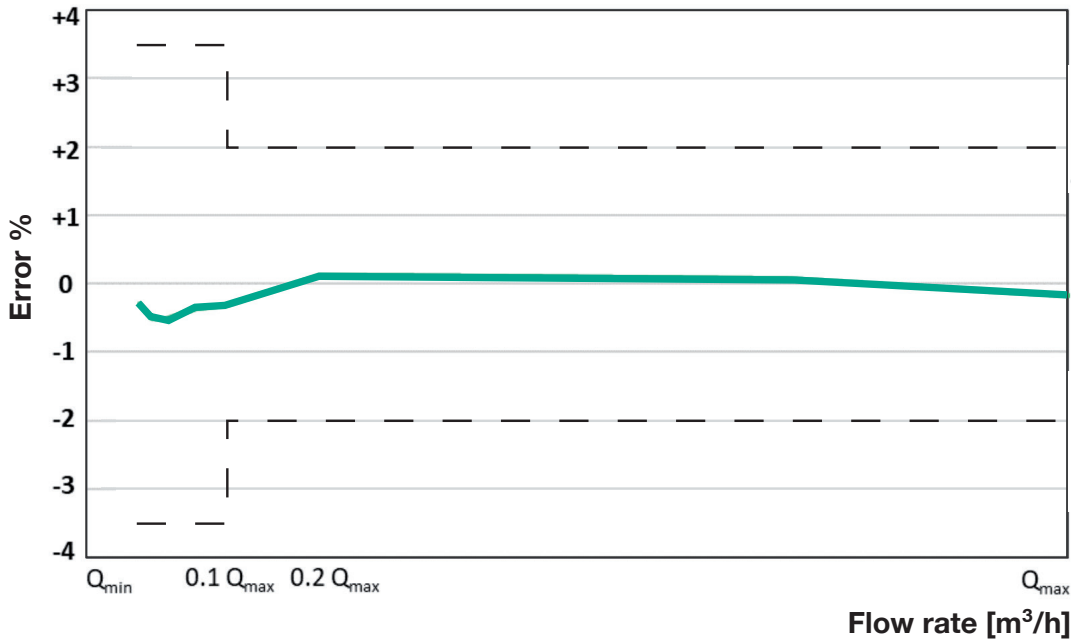


Figure 3 Accuracy curve

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 does not have any moving parts the maintenance requirement is very low.
Thanks to its static design the meter has better 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 **multiple dedicated 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
Measurement Range (Qmin - Qmax)	from 0.040 to 6 m^3/h from 1.4 to 212 cfh
Minimum Flow rate (Qstart)	0.01 m^3/h 0.35 cfh
Maximum Operating Pressure*	up to 50 kPa up to 500 mbar
Pressure drop	≤ 0.2 kPa @Qmax ≤ 2 mbar @Qmax
Ambient temperature*	from -25 °C to 55 °C from -13 °F to 131 °F
Gas temperature range*	from -25 °C to 55 °C from -13 °F to 131 °F
Accuracy	Class 1.5
Ingress protection	Compliant to IP55 (IP66 on request)
Metrological power supplies and operating lifetime	Lithium batteries 15 years for standard version (non-replaceable). 20 years for extended life version (non-replaceable)
Communication power supplies and operating lifetime	Lithium batteries Up to 20 years for communication battery (replaceable) depending on remote communcation interface
Remote communication interface	NB-IoT, GPRS (2G), RF WM-Bus @169 MHz
Communication protocols	DLMS compliant, UNI/TS 11291 compliant, OMS compliant (others on request)
Measuring Gas	Natural Gas (2nd family - group H, L and E - according to EN 437)
High Ambient Temperature approved	T
ATEX classification	II 3G Ex ic IIB T3 Gc
Gas volume compensation	Temperature compensated (TC)
Nominal dimensions	• Connection distance 110 mm • Width 200 mm • Height 130 mm • Depth 110 mm for standard version, 118 mm for extended life version
Connections	1” 1/4 ISO 228, 1” ISO 228, 7/8” ISO 228
(*) REMARK: 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 competitive advantages

- Temperature monitoring sensor
- Advanced diagnostic
- Integrated shut off valve
- Emergency gas shut off for earthquake (optional)
- Open communication protocol
- 15 years metrological battery
- Up to 20 years communication battery life depending on radio interface installed
- Extended life metrological battery option (20 years)
- Biomethane compatible and 20% Hydrogen blending compatible. Higher blending available on request

Materials and **Approvals**

Part	Material
Body	Zinc-coated pressed steel plate
Electronic enclosure	Plastic polycarbonate
REMARK: The materials indicated above refer to the standard models. Different materials can be provided according to specific needs.	

Table 2 Materials

The SSM-iCON is designed to meet OIML R137, EN 14236 and UNI/TS 11291.
The product is certified according to European Directives 2014/32/EU (MID), 2014/34/EU (ATEX) and 2014/53/EU (RED).

OIML R137 | EN 14236 | UNI/TS 11291 | ATEX | MID | RED

Advanced safety

Emergency gas shut off for fire event

The SSM iCON 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 rapid temperature change and shuts off the built-in valve, thus the gas flow is blocked and **can prevent feeding the fire**.

Pressure and temperature monitoring sensor

The SSM iCON can be equipped with pressure and temperature sensors to monitor the gas flow and help the conversion of the raw gas volume into standard conditions that will result the **accurate compensated volume for consumption settlement**. Also, 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 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 shuts off the valve **preventing leakages, and lowering the risk of fire**.

Smart funtionalities

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 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 is equipped with the latest generation **NB-IoT/Cat-M1** 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 capable of communicating on **DLMS, UNI/TS and OMS protocols**, which are designed for the smart meter communication bringing **security, interoperability, efficiency**. These protocols are **globally accepted** and used 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 is compatible with **biomethane, hydrogen blending (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 - standard version

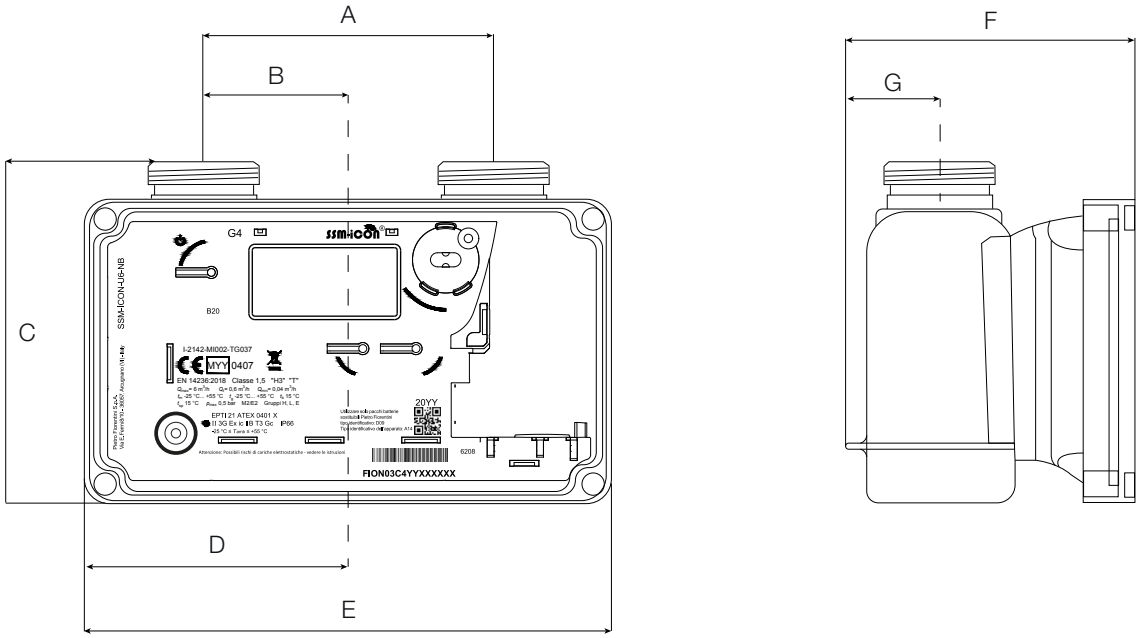


Figure 4 SSM-iCON - standard version dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)		
Model	**iCON**	
Connection distance - [mm]	**110**	
Connection distance - inches	**4.3”**	
	[mm]	inches
A	110	4.3”
B	55	2.2”
C	130	5.1”
D	100	3.9”
E	200	7.9”
F	110	4.3”
G	36	1.4”
Weight	kg	lbs
	1.2	2.6

Table 3 Weights and dimensions

SSM-iCON - extended life version

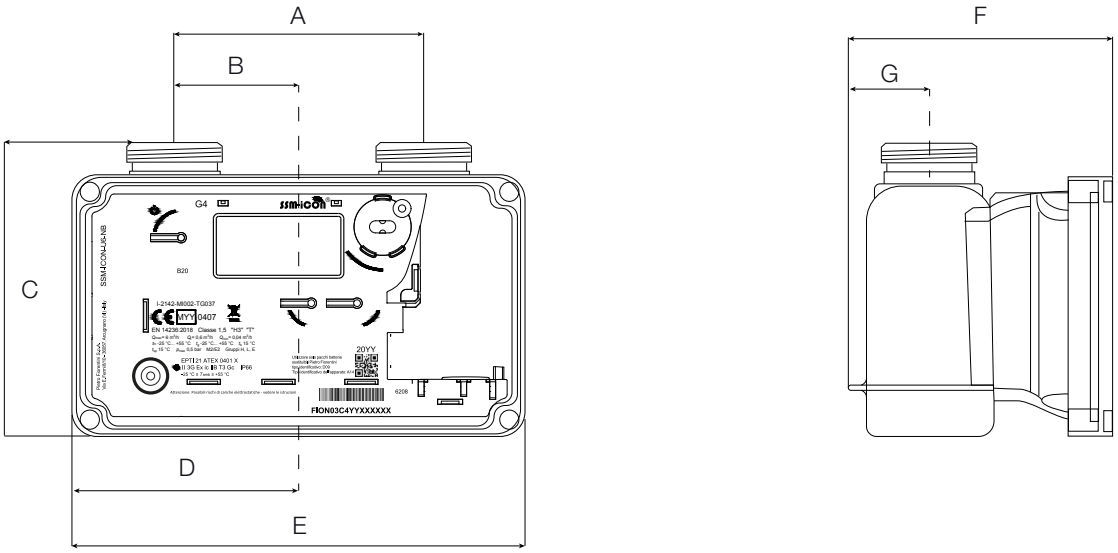


Figure 5 SSM-iCON - extended life dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)		
Model	**iCON**	
Connection distance - [mm]	**110**	
Connection distance - inches	**4.3”**	
	[mm]	inches
A	110	4.3”
B	55	2.2”
C	130	5.1”
D	100	3.9”
E	200	7.9”
F	118	4.6”
G	36	1.4”
Weight	kg	lbs
	1.3	2.9

Table 4 Weights and dimensions

Pietro Fiorentini

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