Pietro Fiorentini

RSE

Residential metering
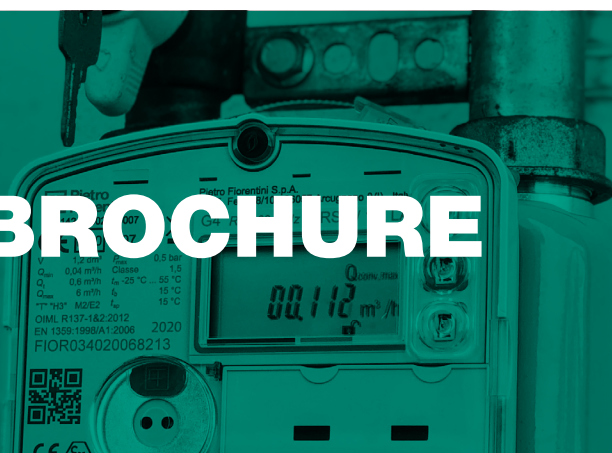
Who we are

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
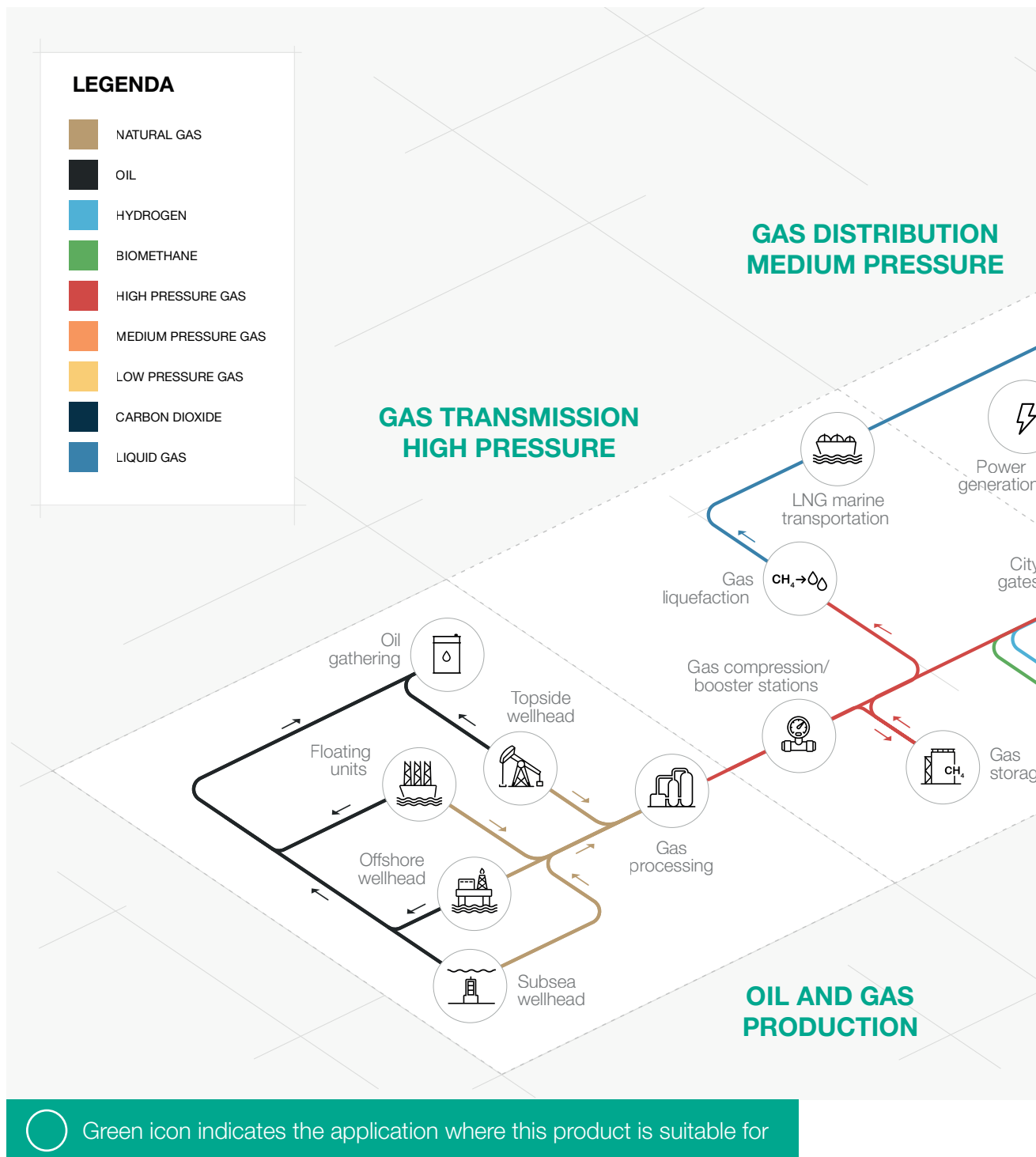
Localised technical support

Experience since 1940
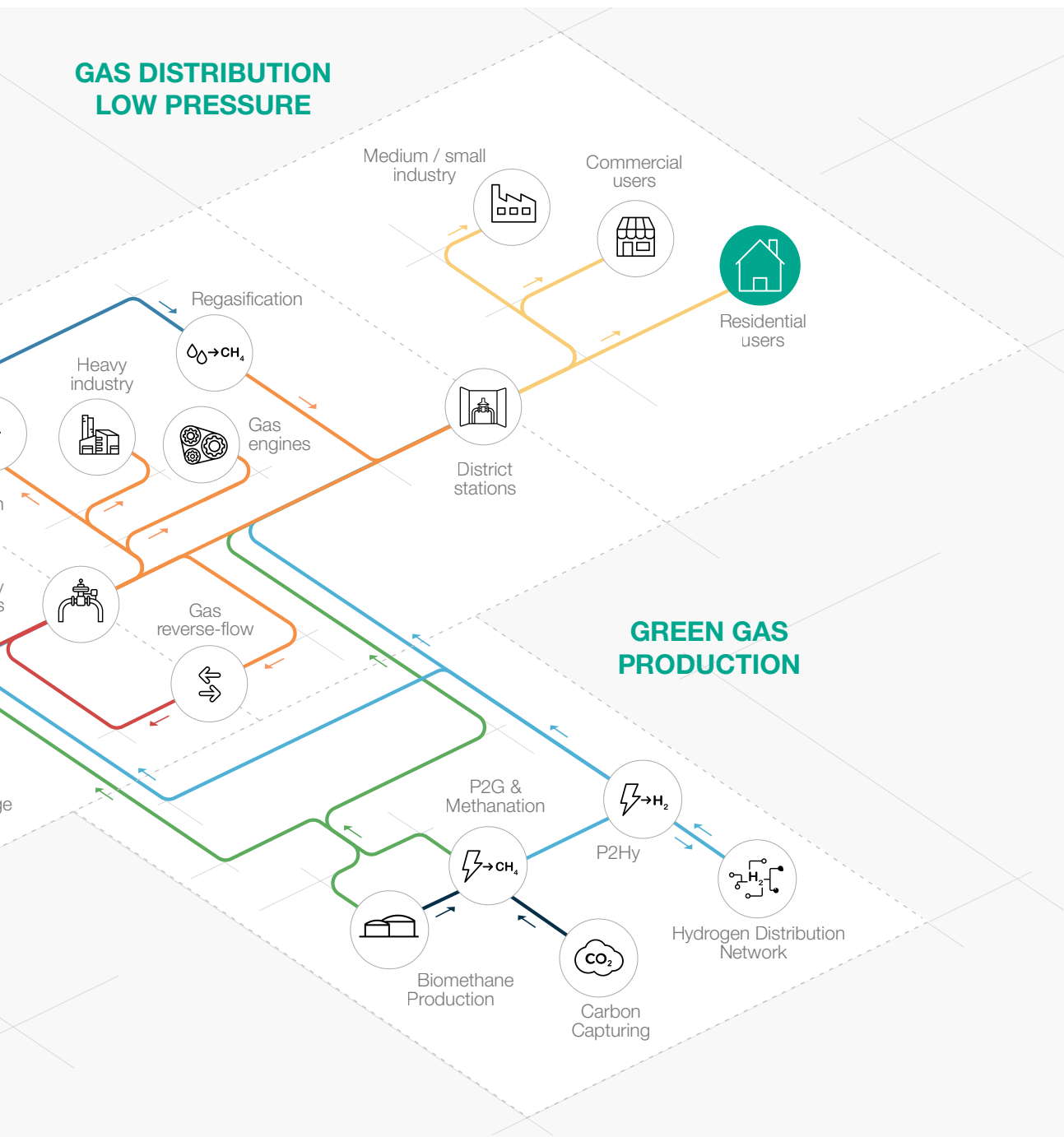
We operate in over 100 countries

Area of Application

LEGENDA

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

GAS DISTRIBUTION MEDIUM PRESSURE

GAS TRANSMISSION HIGH PRESSURE

Power generation

LNG marine transportation

City gates

Gas liquefaction

Oil gathering

Topside wellhead

Gas compression/ booster stations

Floating units

Gas storage

Offshore wellhead

Gas processing

Subsea wellhead

OIL AND GAS PRODUCTION

Green icon indicates the application where this product is suitable for

GAS DISTRIBUTION LOW PRESSURE

Medium / small industry

Commercial users

Residential users

Regasification

Heavy industry

Gas engines

District stations

Gas reverse-flow

GREEN GAS PRODUCTION

P2G & Methanation

P2Hy

Biomethane Production

Carbon Capturing

Hydrogen Distribution Network

Figure 1 Area of application map

Introduction

RSE meters are the outcome of the integration between the traditional Pietro Fiorentini gas meter and the new generation of smart electronic modules.

The mechanical measuring group, already deployed and tested over millions of residential customers, it is well known for its proven accuracy and high reliability over time.

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.

RSE / 1,2 LA   **RSE / 2,4 LA**

Figure 2 RSE meter is available with various communication technologies (GPRS, NB-IoT, Wireless M-Bus) and cyclic volumes and calibers (RSE / 1,2 LA with 1.2 dm^3 available as caliber G1.6 / G2.5 / G4 and RSE / 2,4 LA with 2.4 dm^3 available as caliber G4 / G6)

Features

The **RSE** smart meter by Pietro Fiorentini incorporates the latest communication technology with Temperature Compensation (TC) and built-in shut-off valve (optionally).

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** and **biomethane blends**, this device is used for residential application on low pressure gas distribution networks.

Pietro Fiorentini also provides the Non Temperature Compensated (NTC) version named as **RSV** model.
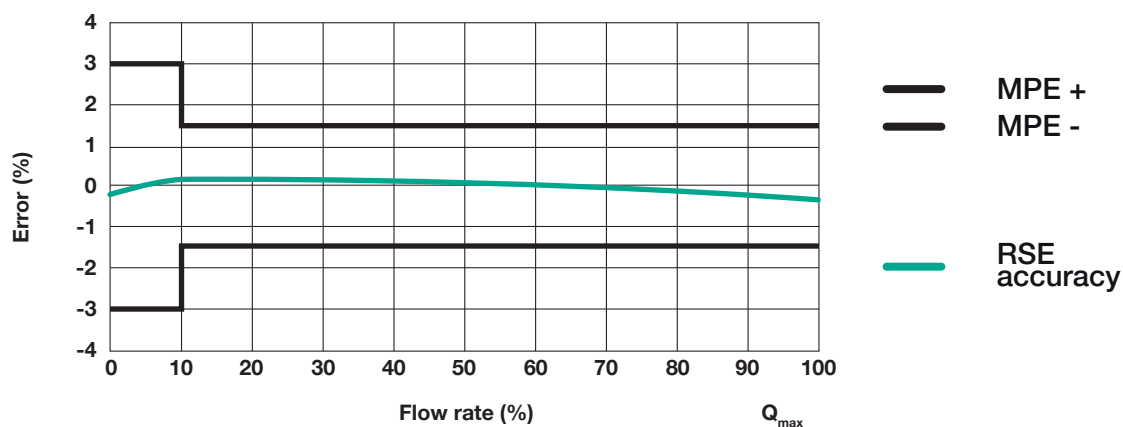
RSE / 1,2 LA pressure loss curve
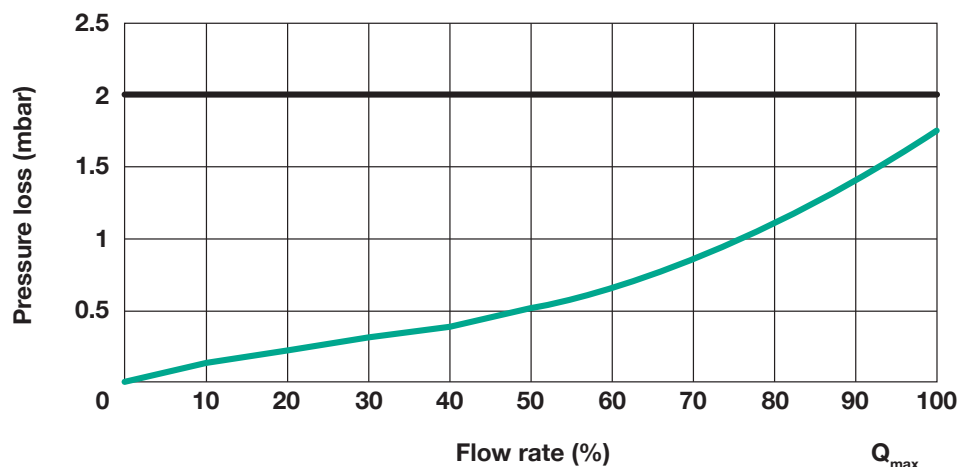
RSE / 2,4 LA pressure loss curve
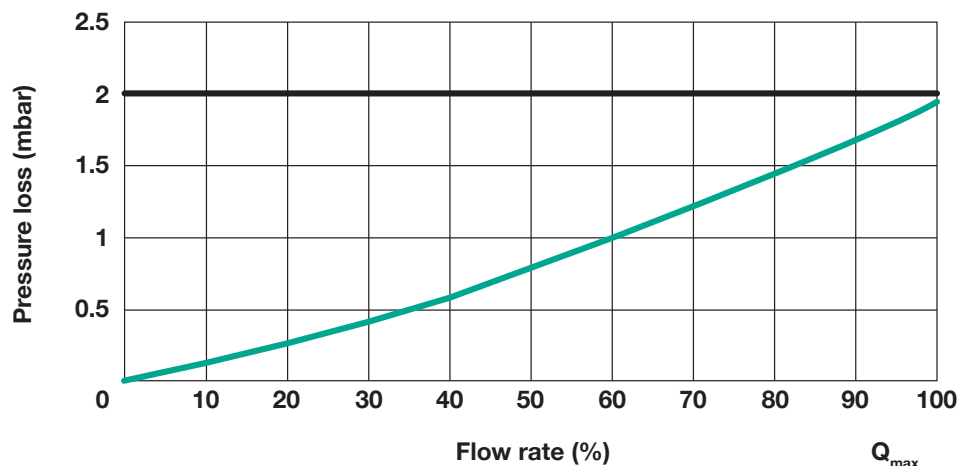
RSE / 1,2 LA accuracy curve
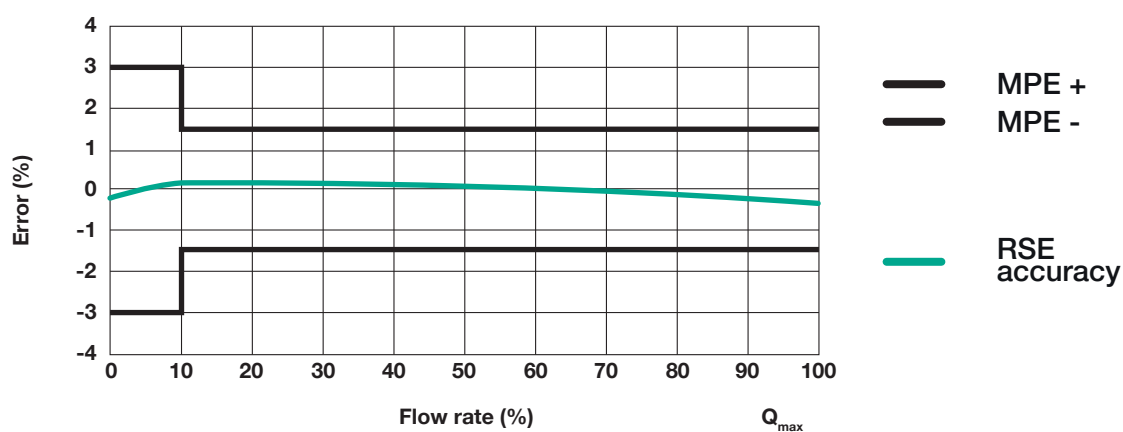

RSE / 2,4 LA accuracy curve

Figure 4 Accuracy curves

Benefits of electronic unit

RSE is an electronically temperature compenseted meter that provides high accuracy measurement data for the end users.

The built-in shut-off valve enables system operators to provide pre-paid service to the customer and additional safety functions.

The display provides access at a glance to main gas meter data, including measured volumes at basic conditions.

The software program of the unit manages all meter functions and ensures measurement accuracy along the supported pressure and temperature scales.

The meter calibration is carried out by an electronic system, best in class for accuracy in calibration.

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 meter software menu structure is designed according to the UNI/TS 11291-11 norm.

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

Features

Features	Values
Minimum Flow rate (Qmin)	• **RSE / 1,2 LA** G1.6 = 0.016 m^3/h | 0.6 cfh G2.5 = 0.025 m^3/h | 0.9 cfh G4 = 0.04 m^3/h | 1.4 cfh • **RSE / 2,4 LA** G4 = 0.04 m^3/h | 1.4 cfh G6 = 0.06 m^3/h | 2.1 cfh
Maximum Flow rate (Qmax)	• **RSE / 1,2 LA** G1.6 = 2.5 m^3/h | 88.3 cfh G2.5 = 4 m^3/h | 141.3 cfh G4 = 6 m^3/h | 211.9 cfh • **RSE / 2,4 LA** G4 = 6 m^3/h | 211.9 cfh G6 = 10 m^3/h | 353.1 cfh
Start Flow rate (Qstart)	• **RSE / 1,2 LA** G1.6 = 3 dm^3/h | 0.10 cfh G2.5 = 5 dm^3/h | 0.17 cfh G4 = 5 dm^3/h | 0.17 cfh • **RSE / 2,4 LA** G4 = 5 dm^3/h | 0.17 cfh G6 = 8 dm^3/h | 0.28 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 (class 1 on request)
Ingress protection	Compliant to IP55
Metrological power supply and operating lifetime	Lithium battery 15-20 years (non-replaceable).
Remote communication power supply and operating lifetime	Lithium battery Up to 20 years (field replaceable) depending on remote communcation interface
Remote communication interface	NB-IoT, GPRS, RF Wireless M-Bus @169 MHz mode N and 868 MHz
Local interface	Infrared optical door ZVEI in accordante to norm EN 62056-21
Communication application protocol	DLMS, UNI/TS 11291 compliant
Measuring Gas	Natural Gas (2nd family - group H, L and E and 3rd family - according to EN 437)
Environment classes	M2/E2
Open location marking	H3
High Ambient Temperature approved	T
ATEX classification	II 3G Ex ic IIB T3 Gc
Gas volume compensation	• Temperature Compensated (TC): RSE version • Non Temperature Compensated (NTC): RSV version
Connections	1" 1/4 ISO 228, 2" ISO 228 mono pipe (others on request)

(*) 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

RSE - RSV competitive advantages

- Temperature compensation (RSE only)
- Advanced diagnostic
- Integrated shut off valve
- World-wide standard communication protocol
- 15-20 years metrological battery
- Up to 20 years communication battery life depending on radio interface installed
- 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 RSE - RSV are designed to meet OIML R137, UNI EN 1359:1998/A1:2006 and UNI/TS 11291.
The products are certified according to European Directives 2014/32/EU (MID), 2014/34/EU (ATEX) and 2014/53/EU (RED).

OIML R137   EN 1359   UNI/TS 11291   MID   RED

The products are certified for hazardous area installation.

ATEX

Smart funtionalities

Advanced diagnostic

The meters are 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 RSE - RSV are 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 RSE - RSV are equipped with the latest generation of **NB-IoT** communication modules to ensure **long-term compatibility** and maintain battery operation lifetime up to 20 years. The communication technology is laying on the strong foundation of **3GPP international standards** that ensures back-to-back compatibility. The meters are equipped with **firmware over-the-air upgrade** function to ensure features evolution and cyber security compliance through its operating lifetime.

Open protocol

The meters are capable of communicating on **DLMS, UNI/TS and WM-Bus 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 meters are 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

RSE - RSV are compatible with **biomethane and natural gas blends**. This positions these meters as a facilitator of the green gas / natural gas blend injection into the gas grid.
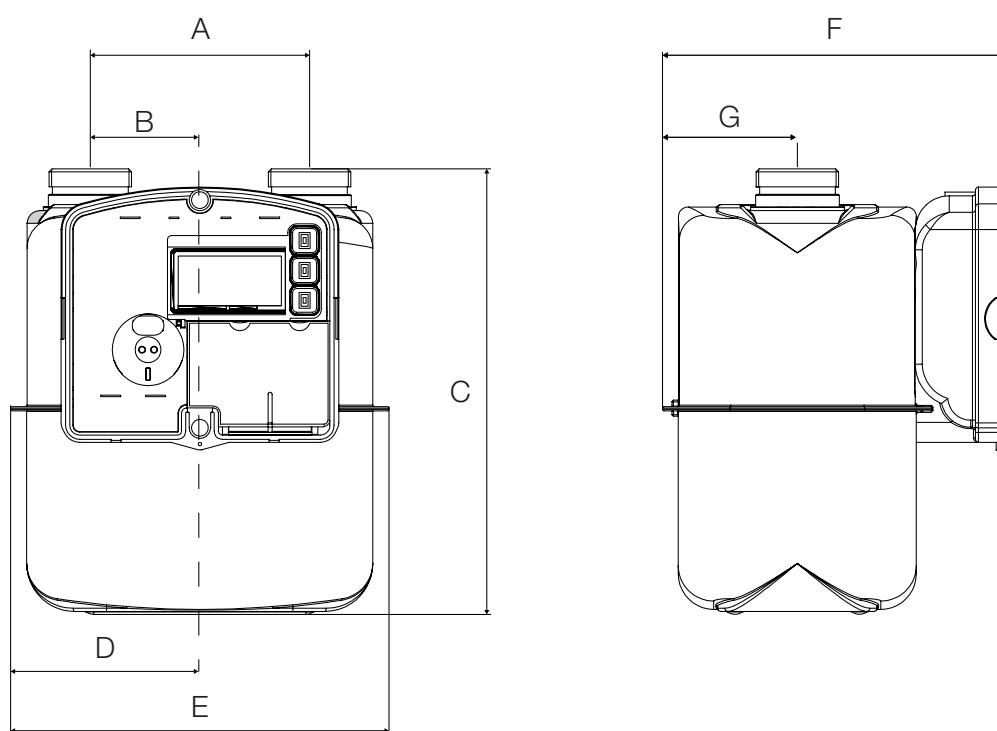
Weights and Dimensions

RSE / 1,2 LA

Figure 5 RSE / 1,2 LA dimensions

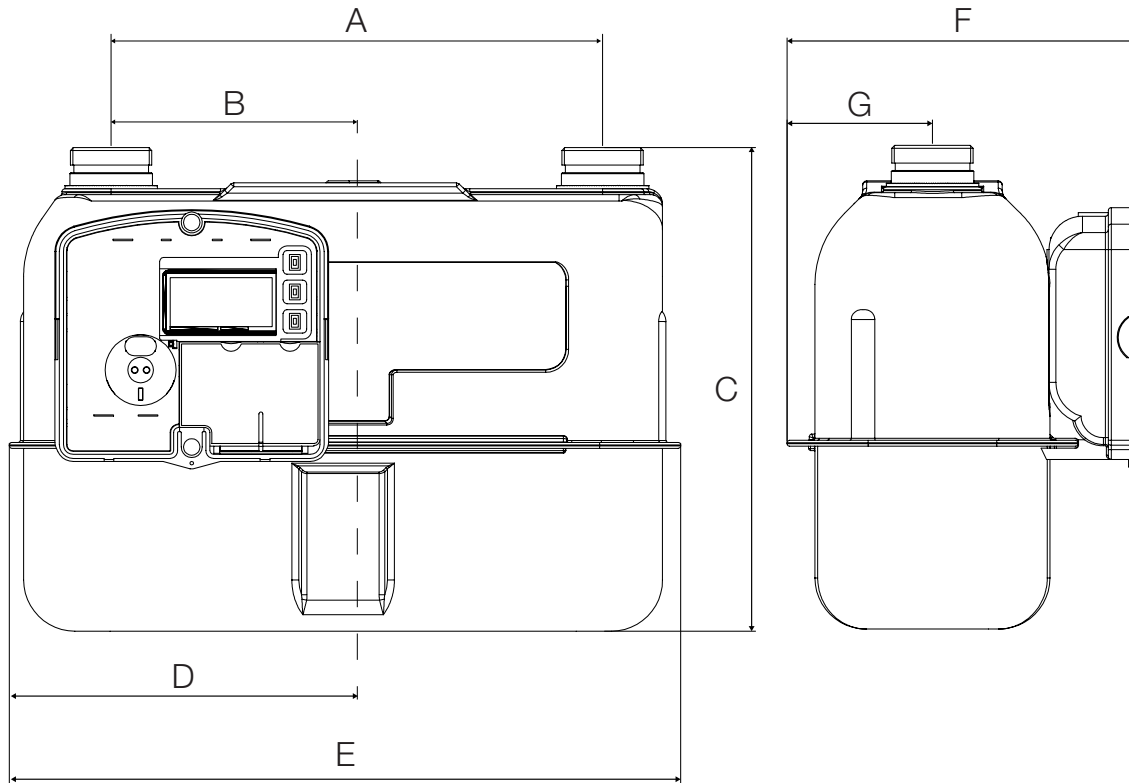| Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)		
Model	RSE / 1,2 LA	
Connection distance - [mm]	110	
Connection distance - inches	4.3"	
	[mm]	inches
A	110	4.3"
B	55	2.2"
C	223	8.8"
D	95	3.8"
E	190	7.5"
F	172.5	6.8"
G	68	2.7"
Weight	kg	lbs
	2.0	4.4

Table 3 Weights and dimensions

RSE / 2,4 LA

Figure 6 RSE / 2,4 LA dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)		
Model	**RSE / 2,4 LA**	
Connection distance - [mm]	**250**	
Connection distance - inches	**9.8"**	
	[mm]	inches
A	250	9.9"
B	125	5"
C	246	9.7"
D	170.75	6.8"
E	341.5	13.5"
F	179	7.1"
G	74	2.92"
Weight	kg	lbs
	3.6	7.94

Table 4 Weights and dimensions

Pietro Fiorentini

www.fiorentini.com