

Our experience in flare and gas metering

A world leader in measurement solutions, GE's flow pedigree spans 45 years with the Panametrics line of flow products. For flare gas, the GF868 has been proven as a superior performer in this typically harsh environment. We have flare installations at thousands of locations across the globe.

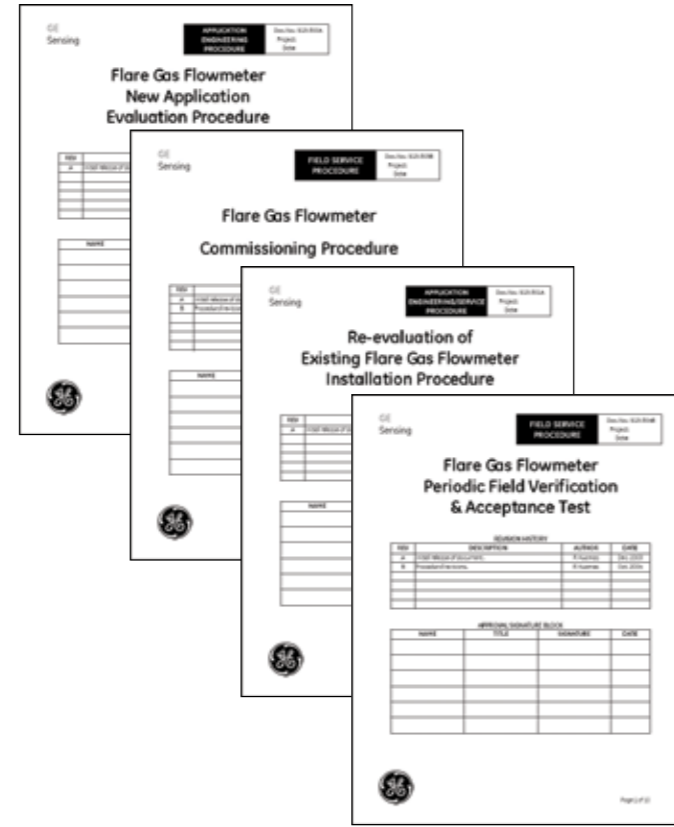
Along with the GF868 for flare, the GM868 and XGM868i general gas flow meters are ideal for other gas measurement where there's no need of live mass flow or huge velocity turn down. They are perfect for lateral flare, stack, and vent lines. And they comply with the EU ETS for flow measurement for monitoring and reporting greenhouse gases emissions.

Our products come with a piece of mind that a GE guarantee brings. We stand behind our products to ensure that you get the quality you expect.

We're at your service

Complying with greenhouse gases regulations takes more than an accurate and reliable flow meter. We have the procedures based on API MPMS 14.10 as required, and they also comply with EU ETS for verification purposes.

From evaluating site data for recommendation on an installation, to field commissioning a new meter or inspecting and verifying existing installations, our applications engineering and field services teams have the expertise and regulatory knowledge to guide and assist you in the successful deployment of gas flow monitoring and reporting



GE
Measurement & Control Solutions

Get Compliant with EU ETS* for Greenhouse Gas Emissions Monitoring and Reporting

Flow meters for flare, fuel and other emitted lines



Contact your local GE representative for more information



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GE imagination at work

*Emission Trading System (Metering of greenhouse gas emissions as per EU Directive 2003/87/EC and Commission Decision 2007/589/EC)

Highlight on the EU ETS regulation

The European Union has set up regulations based on the Kyoto protocol for environment protection. The 2003/87/EC Directive and the EU Commission Decisions such as the 2007/589/EC one, describe the scheme of Greenhouse Gas (GHG) allowance trading. In addition to EU countries, Norway, Iceland and Liechtenstein have voluntarily subscribed to these rules. Additional information and all official documents can be found and downloaded in all EU languages at www.europa.eu.

Gas emissions permits are given to the EU member states. In order to ensure that every country complies with its own allowance, they must monitor and report emissions. The EU regulation for monitoring and reporting emissions and auditing them by a qualified inspector, is expected to be adopted by 31 December 2011.

The Commission Decision 2007/589/EC describes the origins of emissions (from combustion or process) and sets a number of definitions and rules including: what is monitoring, what is reporting, what calculations to use from flow rate to GHG emissions, and installation categorizations, etc.

Installations categories

There are three installations categories, A, B and C, which depend on the mass of emissions.

A installations reported average annual emissions equal or less than 50 ktons of fossil CO2

B installations reported average annual emissions greater than 50 ktons and less than 500 ktons of fossil CO2.

C installations reported average annual emissions greater than 500 ktons of fossil CO2.

The higher the emission level is, the higher the accuracy of the measurements needs to be.

Fall-back overall uncertainty thresholds	
Installation category	Uncertainty threshold to be met for total annual emission value
A	± 7.5%
B	± 5.0%
C	± 2.5%

Source: Commission Decision 2007/589/EC

Emissions calculations

For most industries, emissions calculation comes from the following relationship:

$$\text{CO}_2 \text{ emissions} = \text{activity data} * \text{emission factor} * \text{oxidation factor}$$

Activity data is the measured or calculated flow (if application is fuel used as process input, then flow is multiplied by the net calorific value to obtain activity data. For all other applications activity data is flow only).

Emission and oxidation factors are also described in the official documents.

Sub categories

A, B and C categories have 4 Tiers where activity is taken into account. The higher the tier is, the higher the accuracy of the measurement needs to be.

Some examples of uncertainties about flow measurement:

Annex/Activity	Activity Data					
	Fuel flow			Net Calorific value		
	A	B	C	A	B	C
II. Combustion						
Commercial standard fuels	2	3	4	2a/2b	2a/2b	2a/2b
Other gaseous and liquid fuels	2	3	4	2a/2b	2a/2b	3
Solid Fuels	1	2	3	2a/2b	3	3
Mass-balance approach for carbon black production and gas processing terminals	1	2	3	n.a.	n.a.	n.a.
Flores	1	2	3	n.a.	n.a.	n.a.
Scrubbing						
Carbonate	1	1	1	n.a.	n.a.	n.a.
Gypsum	1	1	1	n.a.	n.a.	n.a.

Source: Commission Decision 2007/589/EC

Fuel consumed: Tier 1 is set at ±7.5%, Tier 2 at ±5%, Tier 3 at ±2.5%, and Tier 4 at ±1.5%

Flores: Tier 1 is set at ±17.5%, Tier 2 at ±12.5%, Tier 3 at ±7.5%

(there's no Tier 4).

These uncertainties are of the measured values, and are typically in mass.s.

The EU Commission took into consideration that measuring flare gas is far from easy and therefore, did not set aggressive expectations for accuracy. Flare measurement has a higher threshold for inaccuracy than other gas measurements.

Type of industries impacted:

It's well known that almost all refineries and petrochemical plants, as well as oil and gas production processes and power plants using fossil fuels are in highest Tier with the lowest acceptable uncertainties.

However, all types of industries need to comply with emissions monitoring and reporting, including: coke metal ore roasting and sintering, iron and steel, cement, lime, glass, ceramic, and pulp and paper.

These European regulations have been translated in local member states regulations to have them implemented in the field. Some countries outside EU adopted similar rules such as already stated Norway, Iceland and Liechtenstein, but also Qatar for instance has set up National regulations based on EU ETS using same thresholds.

Reporting

Reporting is a mandatory requirement. Direction and Commission Decisions set up rules for this with templates. It is to be noted that these reports must be publicly accessible. The reporting frequency is one per year.

Verification

All reports must be verified prior to release. According to the Directive, "It (the verification) shall address the reliability, credibility and accuracy of monitoring systems and the reported data and information relating to emissions..." meaning that the measurement system in use must be verified to confirm that it complies with its original specifications.

Penalties

Member states can be fined with penalties in case of infringements of the national provisions.

Our flow meter technology is also in compliance with American Petroleum Institute (API) Manual of Petroleum Measurement Standards (MPMS), Chapter 14, Section 10, for exploration and production.

To get output in m3/h, Sm3/h, Nm3/h or kg/h, meters need the input of pressure and temperature transmitters. In order to guarantee the global measurement uncertainty, pressure and temperature devices must be calibrated and verified as well.

GE's gas flow meter technology puts you in compliance

Flow Meter type	Our fit for purpose solutions	
	GM868/XGM868i	GF868
Typical applications	Lateral flare, fuel gas, Vent gas, stack	Main flare, fuel gas, lateral flare, stack
Volume (including Normalized and Standardized) Measurement	Y	Y
Mass measurement	Y (with fixed and manual density entered)	Y (with live MW)
Molecular weight measurement	N	Y
P & T live inputs	Y (with optional input board)	Y (with optional input board)
Nb of possible measurement path	1 or 2	1 or 2
Path set up	Diagonal or bias	Diagonal or bias
Retractable transducers under process conditions	Y through valve	Y through valve
Hot tap / Cold tap	Y/Y	Y/Y
Spool meter	Y	Y
Range of gases	Limited Capability (due to big changes in Speed of Sound)	Full capability
Gas velocity range	0.3 m/s to 46m/s (1ft/s to 150ft/s)	0.03m/s to 120m/s (1ft/s to 394ft/s)
Maintenance	Very low drift solutions. Maintain accuracy over years of operation. Annual in-situ verification to comply with ETS. No need to shut down the line for verification purposes.	

GM868 or XGM868i and GF868

GF868 flare meter

The DigitalFlow™ GF868 flare gas flow meter meets the specified accuracy rating and is designed for high performance flare gas applications—for new installations or retrofits. It measures velocity, volume and mass flow rate, and provides average molecular weight of hydrocarbon gases.

The GF868 has one or two channels of measurement for extended precision on one pipe or monitoring of two separate pipes with the same electronic unit.

The GF868 offers distinct advantages over other methods of flare gas flow measurement and solves a variety of difficult problems, such as pulsating pressure, unsteady flow rates, and varying gas composition and temperature. Measurement to very highest or very lowest flow rates is done over pipe sizes from 4 to 120 inches (100 to 3000 mm).

The GF868 also capitalizes on the inherent advantages of ultrasonic flow measurement—reliability, low maintenance, high accuracy, fast response and wide rangeability.

The DigitalFlow™ GM868 gas flow meter meets the specified accuracy rating and is designed for any gas applications. It measures both gas flow velocity and volumetric flow rate. The GM868 can have up to two channels of measurement for extended precision on one pipe or simultaneous measurement of two separate pipes with the same meter.

The DigitalFlow™ XGM868i is a field mount transmitter version of the general gas flow meter, and offers a compact package for hazardous area requirements. The GM868 or XGM868i both provide distinct advantages over other methods of gas flow measurement with the reliability, low maintenance, high accuracy, fast response and wide rangeability of ultrasonic measurement.

GE's flare and vent gas flow meters provide reliable data that can be used for compliance with local rules and regulations, while GE's highly trained field service staff can maintain and verify correct operation and provide reports that comply with any calibration/verification requirements that might be mandated.

GE gas flow meters are designed to give reliable measurement performance while requiring a minimum of maintenance. A complete range of systems is available to suit all flare and vent system requirements and types.

