

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.

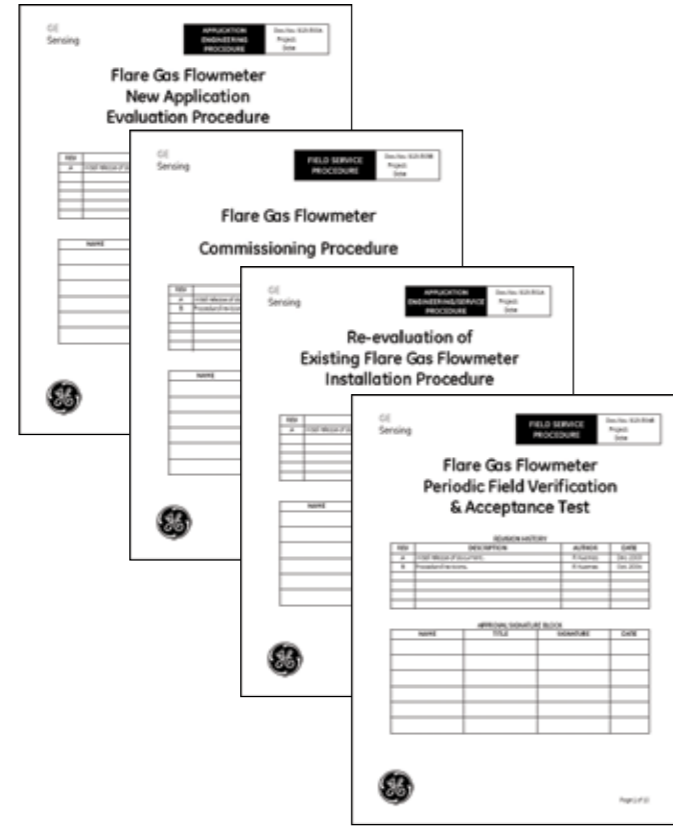
Along with the GF868 for flare, the GM868 and XGM868i general gas flow meters are ideal for other gas measurement where there's no need of live mass flow or huge velocity turn down. They fit perfect for lateral flare, stack, vent lines.... And they comply with the EU ETS for flow measurement in order to monitor and report green house 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 green house gases regulations takes more than an accurate and reliable flow meter. We have the procedures based on API MPMS 14.10 as required, which procedures 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 for your Green House Gas Emissions Monitoring and Reporting*

Use flow meters on Flare, Fuel and other emitted lines



Contact your local GE representative for more information



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GE imagination at work

- * U. S. Bureau of Ocean Energy Management, Regulation and Enforcement
- ** Emission Trading System.
It deals with Metering of Green House Gas Emissions as per EU Directive 2003/87/EC and Commission Decision 2007/589/EC
- *** For compliance to any other local regulation please contact your local GE representative

Limits to Flaring and Venting

Your installations need to cope with US or European based regulations, our flow meters are compliant and help you meeting the standards.

USA regulations

The U.S. Department of the Interior's Bureau of Offshore Energy Management, Regulation and Enforcement (BOEMRE, previously DOI Minerals Management Service, MMS) published a Final Rule on April 19, 2010, in the Federal Register that sets limits on the flaring or venting of natural gas into the atmosphere from wells on federal offshore leases. The ruling is part of 30 CFR Part 250. The BOEMRE regulates air quality under the authority of the Clean Air Act (CAA), for areas in the Gulf of Mexico. The primary purpose of the final rule is to establish criteria for oil and natural gas production to ensure conservation of resources, and to reduce the amount of greenhouse gases emitted from BOEMRE-regulated facilities.

Specific requirements for (Subpart K)

The rule became effective starting May 19, 2010.

To improve data collection, the final rule requires operators to report flaring and venting volumes separately to BOEMRE. The final rule requires the installation of meters to accurately measure all flared and vented natural gas on facilities that process more than 2,000 barrels of oil per day.

Accuracy

All flare/vent meters must measure all flared and vented gas within 5 percent accuracy.

Verification

All meters must be calibrated/verified regularly, in accordance with the manufacturer's recommendation, or at least once every year.

Continual use

All flare/vent meters must be used and maintained for the life of the facility.

Reporting

The user must report the amount of gas flared and the amount of gas vented separately.

European regulations

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 Green House Gas (GHG) allowance trading. In addition to EU countries, Norway, Iceland and Liechtenstein have voluntarily subscribed to these rules.

Gas Emissions permits are given to the EU Member States. In order to ensure every country complies with its own allowance, it is needed to monitor and report emissions. The Commission Decision 2007/589/EC describes origins of emissions (from combustion or process) and set a number of definitions and rules: what is monitoring, what is reporting, what calculations to use from flow rate to GHG emissions, installation categorizations...

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 relation:

$$\text{CO2 emissions} = \text{activity data} * \text{emission factor} * \text{oxidation factor}$$

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 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.
Flares	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 ±5%, Tier 3 ±2.5%, Tier 4 ±1.5%

Flares: Tier 1 is set at ±17.5%, Tier 2 ±12.5%, Tier 3 ±7.5% (there's no Tier 4).

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

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&Gas production processes and Power plants using fossil fuels are in the highest Tier with the lowest acceptable uncertainties. However, all types of industries need to comply with GHG emissions monitoring and reporting including: Coke ovens, 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.

Our fit for purpose solutions		
Flow Meter type	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	

GE's gas flow meter technology puts you in compliance

GM868 or XGM868i and GF868

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, fuel 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.

