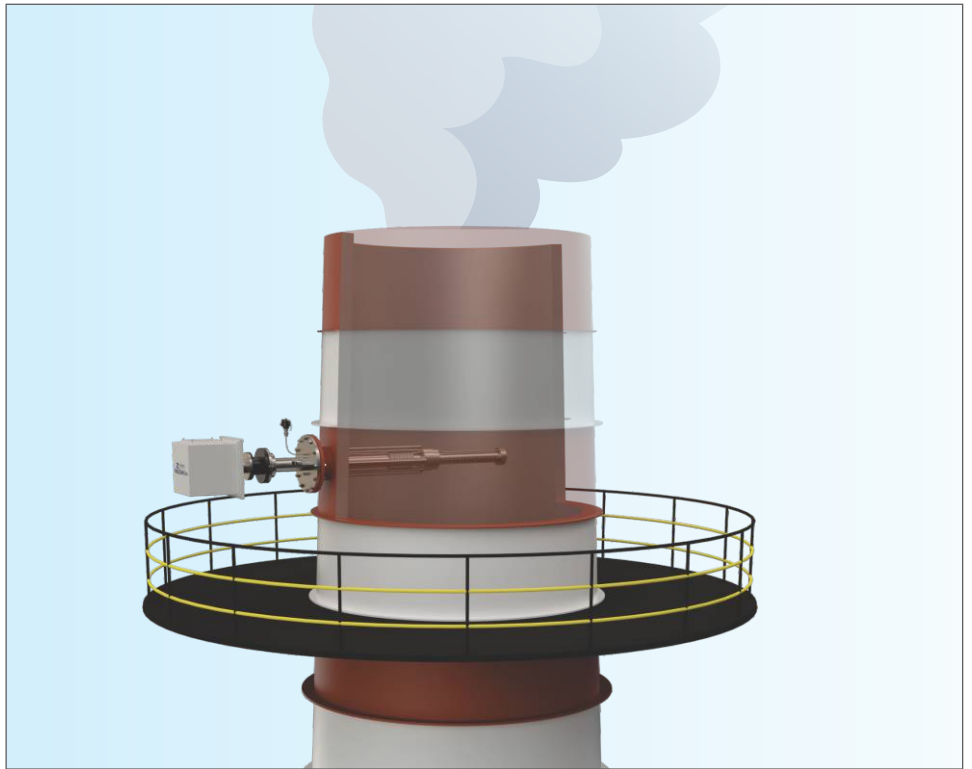


Improving Combustion Efficiency, Monitoring Emissions

Flue gas analyser FMGCEM40xx



FMGCEM40xx



Unburnt and toxic gas emissions contribute to poor air quality which have detrimental effects on human health. In addition to the effect of toxic gases, excessive emission of CO₂, a greenhouse gas causes long-term climate change and associated environmental impact.

Continuous measurement of these gases not only helps industries improve the boiler combustion efficiency and plant safety but also helps reduce pollutant gas emission.

For over 75 years Forbes Marshall has been providing innovative solutions to help businesses improve their process and energy efficiency and be more environmentally responsible. We work with Industry globally to improve production quality and energy efficiency.

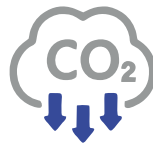
The world-class, fully feature packed FMGCEM40xx gas analyser, manufactured in technical collaboration with Codel International Ltd., UK, a Forbes Marshall group company, provides accurate, reliable measurement. It is available with insitu and extractive measurement techniques and is suitable for a wide range of industry sectors including power, cement, steel, food and beverage, fertilisers and petrochemicals.

Gas analysers provide useful information about the composition and characteristics of stack gases being emitted. This enables the plant to gain valuable insights on the combustion efficiency, emissions monitoring, safety and troubleshooting.

Based on the specific requirements of the monitoring task and the characteristics of the flue gas, either an insitu or an extractive type analyser is used.

The FMGCEM40xx gas analyser works on gas diffusion technique. It uses the well-proven IR gas filter correlation technique, and measures up to seven gases at a time.

Benefits



Reduced carbon emissions



Improved plant safety



Low power consumption



Effective operation



No choking of probe filter



Negligible maintenance



Accomplished service support

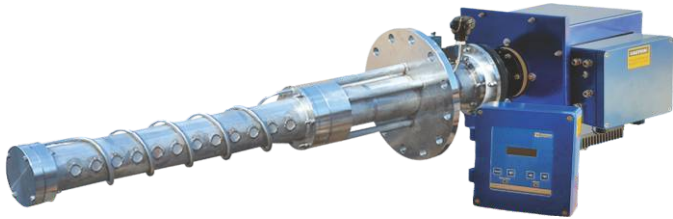


Field mounted / no ac room shelters required



Worldwide installations of more than 5000 gas analysers

Insitu Gas Analyser with Standard Probe



Insitu Gas Analyser with Heated Probe for condensing gases



The FMGCEM40xx insitu model is field proven and is the most preferred continuous emission measurement technique in the industry. The insitu measuring probe mounted on the stack / duct has an intrusive stainless steel measurement chamber equipped with sintered diffuser filter which allows flue gases, excluding particulate, to enter into the measurement chamber.

It is capable of measuring CO, NOx, SO₂, CH₄ and HCL gases together and can be offered with built in measurement of H₂O, CO₂, temperature and pressure parameters for online normalisation.

The FMGCEMxx insitu model is available with non-heated probe for above flue gas dew point temperature, and heated probe for below dew point condensing gases to 200 DegC.

It comes with an online zero and span verification facility, and requires negligible maintenance.

Hot Wet Extractive Gas Analyser



The FMGCEM40xx gas analyser in extractive mode is a field proven continuous emission monitoring system for specific applications. It is designed for use on applications, where the flue gas temperature is abnormally high, low or saturated.

Backed by over three decades of practical experience, this advanced technology gas analyser gives complete flexibility of use on process or emissions applications whilst delivering superb accuracy and repeatability at a competitive price.

The FMGCEM40xx extractive gas analyser uses a truly hot wet measurement technique; no cooling and drying of sampled gas is required.

It is capable of measuring a range of CO, NOx, SO₂, CH₄, HCL, CO₂, H₂O and O₂ simultaneously. With integral temperature and pressure sensors, the analyser can compute fully normalised data directly in mg/Nm³.

It offers accurate and reliable measurement. Being completely field mounted, no separate AC rooms or shelters are required.

This low maintenance analyser, comes with zero and span calibration using audit gas.

Technical Specification	
Series	FMGCEM40xx
Article no.	Refer product codification chart
Measurement of	CO, SO ₂ , NO _x , HCL, CH ₄ , CO ₂ , H ₂ O (O ₂ measurement available in extractive mode) Refer product codification chart
Probe type and length	Insitu, heated probe insitu and extractive type, refer product codification chart
Operating principle	Infrared absorption gas filter correlation technique. Zirconium Oxide for O ₂ measurement.
Measuring range	CO, SO ₂ , NO _x , CH ₄ , HCL - 0...100 ppm / 0...3000 ppm, mg/m ³ and mg/Nm ³ O ₂ , CO ₂ , H ₂ O: 0-25% Ranges are fully site selectable. Other ranges available on request.
Response time (T90)	Detection less than 10 seconds, calibration response time less than 200 seconds
Accuracy	CO, SO ₂ , NO _x , CH ₄ , HCL : 2 ppm or 2% of span O ₂ , CO ₂ , H ₂ O: 0.5 % or 2% of span
Zero and span drift	± 2% per month (if auto zero calibration is inactive)
Calibration	Automatic / Manual zero calibration using plant instrument air. Span verification manually - using audit gases.
Ambient temperature	- 20 °C to + 55 °C
Flue gas temperature	Refer codification chart
Flue gas pressure	± 510 mm WC
Flue gas dust limit for Insitu Probe	Upto 10 gm/m ³ standard, for higher dust concentration and for mounting probe before ESP additional protection tube required
Power supply	110/220VAC , 50Hz ± 10%, Gas analyser power consumption: 400VA Heated probe power consumption: Startup 400VA, usual 100VA Heated sample line power consumption: 60 -100W/mtr depending on application Heated sample pump power consumption: less than 100VA
Purge requirement	Clean and dry plant instrument air, air consumption during normal operation 5LPM (not applicable if ordered in extractive mode) during calibration 10LPM @ 3-5 bar pressure
Construction	Probe : SS316L Transceiver unit - Corrosion resistance powder coated aluminum housing sealed to IP66 Electronic unit - Die-cast aluminum corrosion resistance powder coated sealed to IP66 Interconnecting cable / pneumatic tubing 10m standard, higher on request
Outputs	4-20mA, 500Ω output for the ordered measurement parameters Volt free contact SPCO rated at 50V/1A for the ordered measurement parameters Volt free contact SPCO rated at 50V/1A for system fault RS485 interface output
Compliances	EMC - 89/336/EEC directive compliant Low Voltage -73/23/EEC directive compliant TUV/MCERT EN 15267 standard complaint
For hazardous area	Optional : Positive pressure purged enclosure with flameproof purged control units

Product Codification Chart							
FMGCEM40xx Gas Analyser	Description	Insitu (I)			Extractive (E)		
		Measuring parameter	CO, SO ₂ , NO _x , CO ₂ , H ₂ O temperature and pressure	A			A
	HCL and temperature	3			3		
	CO, CO ₂ , H ₂ O, temperature and pressure	5			5		
	CO, SO ₂ , NO _x , HCL, CO ₂ , H ₂ O, temperature and pressure	6			6		
	SO ₂ , NO _x , CO ₂ , H ₂ O, temperature and pressure	8			8		
	CO, NO _x , CO ₂ , H ₂ O, temperature and pressure	9			9		
Flue gas temperature	Below dew point, saturated		J			P	
	Dew point to 250 deg.c		0			S	
	Dew point to 400 deg.c		1			S	
	Dew point to 600 deg.c		-			S	
	Above 600 deg.c to 900 deg.c. higher temperature on request		-			H	
Probe insertion length	1.8 mtr probe with 8" flange			A			-
	1 mtr probe with 4" flange			B			**
	ARC coated 2.3 mtr probe with 8" flange for concrete stack			C			-
	1.5 mtr probe with 4" flange			D			
	1.8 mtr heated probe with 8" flange for condensing gas			E			

J : Heated Probe, P: PTFE, S: SS316, H: Hastelloy

Note:

**GCEM 40 E sample probe insertion length is 1 mtr, other lengths available on request.

Optional : HMI display available for FMGCEM40E analyser

Enhanced CEMS Uptime Services

Legislative authorities mandate an uptime of 85% for continuous emission monitoring systems, with monthly, quarterly and annual reporting as per prescribed format. Regular calibration and maintenance are necessary to ensure the accuracy and reliability of the monitoring data. A record of system operation, maintenance, calibration, and reasons for downtime needs to be maintained.

Forbes Marshall Enhanced CEMS Uptime Service helps plants bridge the gap between desired and actual performance through proactive health monitoring of the system and its components. An expert team works round the clock on monitoring, analysis and diagnosis of data to improve and sustain system performance.

Deliverables



Uptime
Increase the instrument uptime



Health
Continuous monitoring by experts on health of the instruments generating easy to follow preventive actions



Benchmarks
Highlights critical emission upsurges



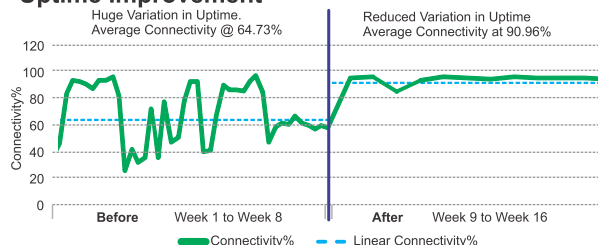
Proactive Support
Suggestions and recommendations on proactive maintenance



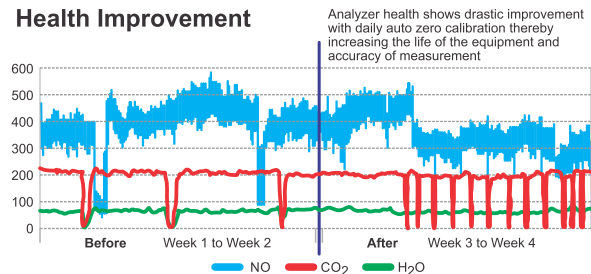
CEMS data transmission to
CPCB / SPCB server

A Typical 250 MW Thermal Power Plant

Uptime Improvement



Health Improvement



Our Other Offerings

Product and Model No.	DCEM2100A Insitu Non Contact	ET301 Insitu Probe	DCEM3100 Extractive Dust Monitor	VCEM5100 Insitu Non Contact	Oxitec 5000 Insitu Probe	ET201 Extractive
Parameters Monitored	Opacity / Dust	Dust	Dust	Gas flow	Oxygen	CO and O ₂
Purpose	Emission and ESP performance	Emission and bag filter performance	Emmission Monitoring	Volumetric Emission	Combustion Control and normalisation	Coal Mill / Silo / Bunker Safety
Suitable for Stack	Stack ID >1 mtr	Stack ID <4 mtr	Condensing Gases	Stack ID >0.5 mtr	Stack / duct ID >0.5 mtr	Not Applicable



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