

Environnement s.a.

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Certificat de Contrôle Qualité *Quality Test Certificate*

INSTRUMENT : CO12M

COMMANDE/ ORDER : ESP/12-MAN0019

N°/ SN : 979

PROPRIETE DE/ PROPERTY OF :

Cet instrument a été fabriqué et étalonné suivant les normes de fabrication en vigueur dans notre usine de Poissy - France. A chaque étape de la fabrication, différentes séries de tests et de contrôles approfondis ont été réalisées et assurent un fonctionnement correct et précis de l'appareil. Toutes les caractéristiques sont conformes aux spécifications définies par le constructeur et par la plupart des Organismes Internationaux de Normalisation. La procédure métrologique utilisée est conforme et satisfait aux critères de notre programme qualité.

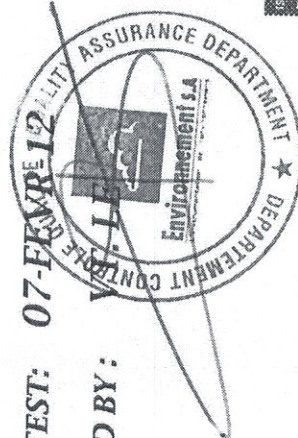
The above instrument was manufactured, checked and calibrated according to our working standards in our plant of Poissy - France. At each step in the manufacturing process, we have performed extensive series of tests and controls which ensure proper and reliable functioning. All features were found to meet those specified by manufacturer and by most of the International Standard Organizations. The metrology procedures utilized conform to and satisfy requirements of our quality program.

TESTÉ PAR/ TESTED BY : A.TOUNKARA

CERTIFICAT(E) N° : CO12M9795641

DATE DU TEST/ DATE OF TEST: 07-EXPR-12

APPROUVE PAR/ APPROVED BY :



Combustion gas analyser KIGAZ 310



KEY POINTS

-  Long-life O₂ sensor
-  Interchangeable CO-H₂, NO, NO₂, SO₂, CH₄ sensors
-  CO dilution
-  Auto-zeroing in the flue
-  Gas flow auto-setting

- Single connector
- Interchangeable probe
- 2 Go memory (100 000 measurements)
- Intuitive graphic interface
- LED on the probe handle to light dark areas
- Built-in printer
- Built-in water trap with max level alarm
- 3 pressure sensors

CONFORMITY AND STANDARDS

Conformity

The analyser is in compliance with the following european directives:

- 2004/108/EC
- 2006/95/EC Low voltage
- 2011/65/EU RoHS II
- 2012/19/EU WEEE

Standards

The analyser is in compliance with the EN 50379-1 and EN 50379-2 standards.



KIGAZ MOBILE
Application

FEATURES OF THE INSTRUMENT

GAS	- Autozeroing in the flue - CO dilution up to 5% ¹	Flue gases CO and CO ₂ , ambient max CO	Interchangeable sensors: long-life O ₂ , CO-H ₂ , NO, NO ₂ , SO ₂ , CH ₄ (optional)	Excess air Losses	Efficiency > 100%
PRESSURE	Differential pressure measurement	High accuracy draft measurement with autozero by solenoid valve	Gas flow auto-setting		
TEMPERATURE	Ambient temperature	Flue gas temperature	Delta Temperature	DHW Temperature 2 thermocouples	Dew point temperature
OTHER FUNCTIONS	15 programmed combustibles ²	Adding 5 combustibles by the user	Opacity index		

¹With an accuracy of ±10% of the measurement

²Combustibles: Sahara/Fos-sur-Mer Natural Gas, Groningen Natural Gas, Russia/North Sea Natural Gas, Propane, LPG, Butane, Light Oil, Heavy Oil, Bituminous coal, Hard coal, Coke gas, Bio fuel 5%, Wood 20%, Wood-chip 21%, Pellet 8%

MEASURING RANGE

Parameters	Sensor	Measuring range	Resolution	Accuracy*	T ₉₀ response time
Long-life O ₂	Electrochemical	From 0% to 21%	0.1% vol.	±0.2% vol.	30 s
CO (with H ₂ compensation)	Electrochemical	From 0 to 8000 ppm	1 ppm	From 0 to 200 ppm: ±10 ppm From 201 to 2000 ppm: ±5% of the measured value From 2001 to 8000 ppm: ±10% of the measured value	30 s
NO	Electrochemical	From 0 to 5000 ppm	1 ppm	From 0 to 100 ppm: ±5 ppm. From 101 to 5000 ppm: ±5% of the measured value	30 s
Low range NO	Electrochemical	From 0 to 500 ppm	0.1 ppm	From 0 to 40 ppm: ±2 ppm From 41 to 500 ppm: ±5% of the measured value	30 s
NOx	Calculated**	From 0 to 5155 ppm	0.1 ppm or 1 ppm***	-	-
NO ₂	Electrochemical	From 0 to 1000 ppm	1 ppm	From 0 to 100 ppm: ±5 ppm. From 101 to 1000 ppm: ±5% of the measured value	80 s
SO ₂	Electrochemical	From 0 to 5000 ppm	1 ppm	From 0 to 100 ppm: ±5 ppm. From 101 to 5000 ppm: ±5% of the measured value	80 s
CO ₂	Calculated**	From 0 to 99% vol	0.1% vol	-	-
CH ₄	Semiconductor	From 0 to 10000 ppm From 0 to 1% Vol From 0 to 20%LEL	1 ppm 0.0001% Vol 0.002%LEL	±20% of full scale	40 s
Flue gas temperature	K thermocouple	From -100 to +1250°C	0.1°C	±0.4% of the measured value or ±1.1°C	45 s
Ambient temperature	Internal NTC	From -20 to +120°C	0.1°C	±0.5°C	-
Ambient temperature	Pt100 (1/3 DIN external probe)	From -50 to +250°C	0.1°C	±0.3% of the measured value ±0.25°C	30 s
Dew point temperature	Calculated**	From 0 to +99°Ctd	0.1°C	-	-
DHW temperature	TcK (external probe)	From -200 to +1300°C	0.1°C	±0.4% of the measured value or ±1.1°C	-
Draft	Piezoelectric	From -10 to +10 Pa From -1000 to +1000 Pa	0.1 Pa 1 Pa	From -100 to -10 Pa: ±2 Pa From -10 to +10 Pa: ±0.5 Pa From +10 to +100 Pa: ±2 Pa Above: ±2% of the measured value	-
Differential pressure	Piezoelectric	From -20 000 to +20 000 Pa	1 Pa	From -20 000 to -751 Pa: ±0.5% of the measured value ±4.5 Pa From 750 to -61 Pa: ±0.9% of the measured value ±1.5 Pa From -60 to 60 Pa: ±2 Pa From 61 to 750 Pa: ±0.9% of the measured value ±1.5 Pa From 751 to 20 000 Pa: ±0.5% of the measured value ±4.5 Pa	-
Losses	Calculated**	From 0 to 100%	0.1%	-	-
Flue gas velocity	Calculated**	From 0 to 99.9 m/s	0.1 m/s	-	-
Excess air (λ)	Calculated**	From 1 to 9.99	0.01	-	-
Lower efficiency (ηs)	Calculated**	From 0 to 100%	0.1%	-	-
Higher efficiency (ηt) (condensation)	Calculated**	From 0 to 120%	0.1%	-	-
Opacity index	External instrument	From 0 to 9	-	-	-

*All accuracies indicated in this document were stated in laboratory conditions and can be guaranteed for measurements carried out in the same conditions, or carried out with required compensation.

**Calculation is made based on the measured values by the analyser.

***The resolution is 0.1 ppm if the NO sensor is a low range NO sensor (0-500 ppm). The resolution is 1 ppm if the sensor is a NO 0-5000 ppm.

TECHNICAL FEATURES

Dimensions	Instrument: 331 x 112 x 86 mm; Flue gas probe: 300 mm; Cable length: 2.50 m
Weight (battery included)	1120 g
Display	TFT 3.5" colour screen
Keypad	Elastomer keypad; 3 function keys; OK key; 4 direction arrows; ON/OFF key; Escape key
Material	Housing and probe: ABS; Probe cable: neoprene; Plasturgy of detachable probe: PA 6.6 reinforced 30% glass fiber
Communication	USB / Bluetooth® (optional)
Protection	IP40

TECHNICAL FEATURES (follow-up)

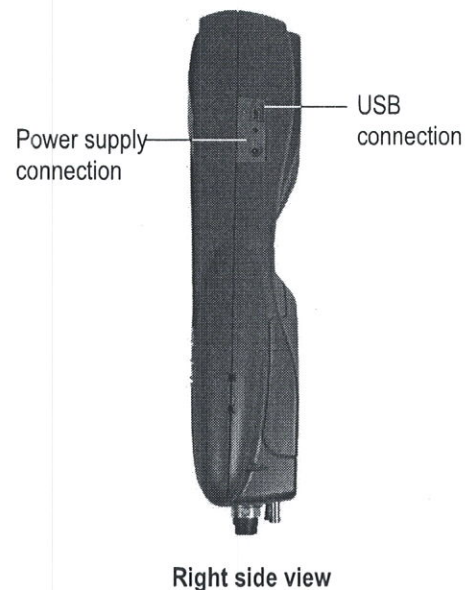
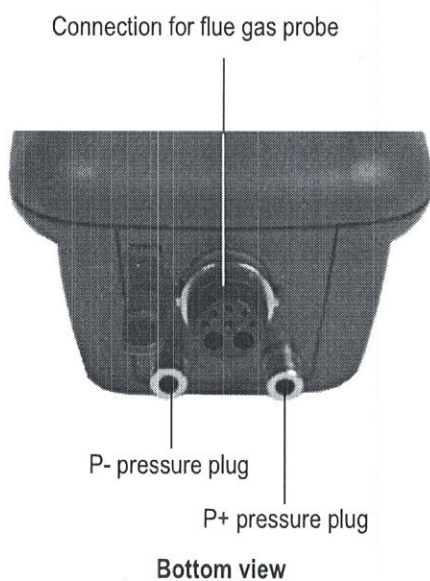
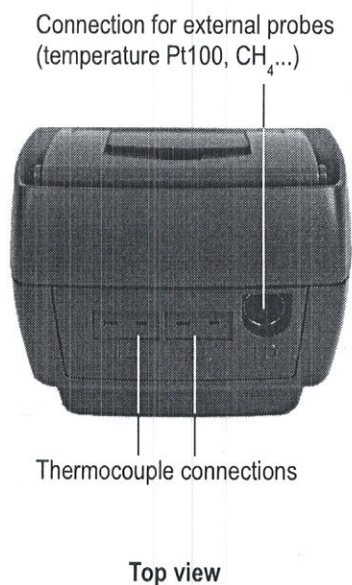
Battery life / Power supply	10 h in continuous operating / Li-Ion battery 6 V 1.5 A Voltage of power supply: 100-240 VAC, 50-60 Hz
Battery charging time	10 h
Operating / storage temperature	From +5 to +50°C / From -20 to +50°C. Altitude: from 0 to 2000 m.

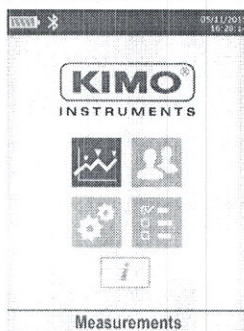
INSTRUMENT DESCRIPTION

> Overview

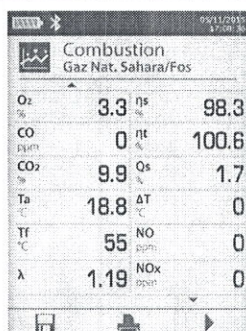


> Connections





Analysers menu



Example of analysis



DHW network temperature



Ambient CO checking

SUPPLIED WITH

Model	KIGAZ 310 CLA	KIGAZ 310 STD	KIGAZ 310 PRO
Supplied with			
Number of interchangeable sensors	2 (O ₂ long life, and CO-H ₂)	3 (O ₂ long life, CO-H ₂ and NO)	4 (O ₂ long life, CO-H ₂ , NO, NO ₂ or SO ₂)
Scalable	Yes: CH ₄ , NO, NO ₂ , SO ₂	Yes: CH ₄ , NO ₂ , SO ₂	-
Calibration certificate	Yes	Yes	Yes
Transport case	Yes	Yes	Yes
300 mm flue gas probe	Yes	Yes	Yes
Magnetic protective cover	Yes	Yes	Yes
Differential pressure kit	Yes	Yes	Yes
LIGAZ-2 software	Yes	Yes	Yes



The analysers are supplied with the LIGAZ-2 software

The LIGAZ-2 software allows:

- Database creation (customers, boilers, inspections)
- Inspections downloading and printing
- Synchronization instrument/PC (customers, boilers, inspections).
- Analyser configuration



Transport case



LIGAZ-2 software

ACCESSORIES*



LIGAZ-2: Software allowing database creation (customers, boilers and inspections), inspections downloading and printing, customisable procedure reports creation, inspection planification, on-site service contracts management (operator planning, customer care) and real-time measurements visualisation and recording.



- SCOT: Ambient CO probe



- SCO2T: Ambient CO₂ probe



- SPA 150SP: Ambient Pt100 probe



- SKCL 150: Thermocouple probe



- SCI: Ionisation current measurement probe



- PS-180: Flue gas with interchangeable contact duct, 180 mm length, use up to 500°C

- PS-300: Flue gas with interchangeable contact duct, 300 mm length

- PS-750: Flue gas with interchangeable contact duct in INCONEL, 750 mm length

- PS-1000: Flue gas with interchangeable contact duct in INCONEL, 1000 mm length



- SDFG: Gas leak detection probe (CH₄)



- PMO: Opacity pump
Supplied with 50 filters and a reference table



- KEG: Gas network tightness kit



Bluetooth® module

Allows connection to the KIGAZ MOBILE application:

- Graphic visualisation
- Saving
- Exportation under CSV, XML, PDF format
- Reports sending by e-mail



KIGAZ MOBILE application for smartphones and tablets



*See the technical datasheet of accessories for KIGAZ for more details.

www.kimo.fr

Distributed by :



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RAPPORT DE TESTS

TEST REPORT

CO12M

**ANALYSEUR DE MONOXYDE ET DE
DIOXYDE DE CARBONE PAR
CORRELATION INFRAROUGE**

***INFRARED CORRELATION CARBON
MONOXIDE AND DIOXIDE ANALYZER***

ENVIRONNEMENT SA

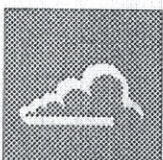
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Environnement s.a
L'instrumentation de l'environnement

N° série : 979

Serial number

Client : RSI ELECTRO SRL

Customer

N° de commande :

Order number

ESP/12-MAN0019

Tension / fréquence d'alimentation : 220/50 V/Hz

Main supply

Equipement :

Equipment

- Filtre d'entrée poussière

Inlet dust filter



- Programme

Software

VERSION : V1.00.b

- Carte E.S.T.E.L.

E.S.T.E.L. board



- Carte S.O.R.E.L.

S.O.R.E.L. board



Gaz : CO CO2

Gas

Contrôles et ajustements :

Checks and adjustments

Circuit fluide

Gas circuit

- Débit

Flow rate

Echantillon :

Sample

60 l.h⁻¹

Zéro :

Zero

60 l.h⁻¹

Etalon :

Span

60 l.h⁻¹

- Pression

Coef A: 0,2291

Valeur lue: 991 mbar

Coef B: 69

Sorties analogiques (Carte E.S.T.E.L.)

Analog output (E.S.T.E.L. Board)

Ka

Kb

Type

- Voie 1
Channel 1
- Voie 2
Channel 2
- Voie 3
Channel 3
- Voie 4
Channel 4

Configuration

configuration

Mode de mesure

measurement mode

K étal CO : **1,1645**

K étal CO₂ : **1,0206**

K étal CH₄ :

Liaison série

serial link

• COM 1 :

Vitesse : 9600
speed

• COM 2 :

Vitesse : 9600
speed

RS232 ☒

Format : 8n1
format

Format : 8n1
format

RS422 ☐

Mode : Mod4
mode

Mode : Impres
mode

Maintenance

maintenance

Signaux MUX

MUX signals

N° voie MUX Mux. Channel.	Signal	Valeur typique Typical value	Mesures Measurements	Limites Limits
1	GND Ground°	0 mV	0	-10 < < 10 mV
2	T° Interne Internal T°	300 mV	329	100 < < 500 mV
3	T° Optique Optical T°	460 mV	454	445 < < 475 mV
4	Inutilisé Not used			
5	Débit Flow rate	5000 mV	4863	4100 < < 5100 mV
6	Pression Pressure	4000	4202	3700 < < 4300 mV*
7	V. Réf -15V -15 Ref.	-1500 mV	-1509	-1550 < < -1450 mV
8	V. Réf +15V +15 Ref.	+1500 mV	1489	1450 < < 1550 mV
9	I PbSe Cooler intensity	500	431	300 < < 900 mV
10	I IR Infrared signal	1000	975	960 < < 1020 mV
11	Inutilisé Not used			
12	Inutilisé Not used			
13	Inutilisé Not used			
14	Inutilisé Not used			
15	Inutilisé Not used			
16	Réf. 2.5V 2.5V Réf	2500 mV	2490	2490 < < 2510 mV

*valeurs dépendantes de la pression atmosphérique
values depend on atmospheric pressure

Réglages E2POT

E2POT settings

Signal MES : **5995 / 40**

MES signal

Signal REF : **5852**

REF signal

REMARQUES

Remarks

Analyzer equipped with ARM7 board (V3.5.f)

USB-TCPIP option

IP Address : 192.101.130.79

CO2 : A = 1693,7 ; B = 5,3375 ; C = 67,1998 ; D = -368,66

TESTE PAR :

Checked by

A.TOUNKARA

Le :

On

07-févr-12

METROLOGIE PDV

LABORATOR DE METROLOGIE

PDV

Laborator de etalonare
atestat B.R.M.L.
SR EN ISO/CEI 17025:2005
ATESTAT Nr. PH-12-03-18

CERTIFICAT DE ETALONARE nr. 120-2018 Calibration Certificate

Obiect Object	Analizor staționar de gaze	Acest certificat de etalonare documentează trasabilitatea rezultatelor prezentate la Sistemul Internațional de Unități(SI). Trasabilitatea măsurărilor este realizată și menținută prin etalonări periodice, în conformitate cu SR EN ISO/CEI 17025:2005. Incertitudinea standard de măsurare a fost determinată în conformitate cu EA 4-02. Este recomandat ca utilizatorul să asigure reetalonarea la intervale de timp rezonabile. This calibration certificate documents the traceability of the presented results to the International System of Units(SI). The measurement traceability is achieved and maintained by periodically calibrations, according to SR EN ISO/CEI 17025:2005. The standard uncertainty of measurement has been determined according to EA 4-02. It is recommended to the user to assure the recalibration at reasonable time intervals.
Fabricant Manufacturer	ENVIRONNMENT SA – Franța	
Tip Type	AC32M	
Serie Serial number	Serie AC32M: 3388 – serie modul extern NH ₃ : 447	
Client Customer	AGENȚIA PENTRU PROTECȚIA MEDIULUI PRAHOVA	
Comanda nr. Order No.	268/03.12.2018	
Număr de pagini Number of pages	2	
Data etalonării Date of calibration	03.12.2018	

Nota : Acest certificat de etalonare nu poate fi reprodus decât în totalitate. Certificatul de etalonare fără semnături și stampilă nu este valabil.
Note : This calibration certificate may not be reproduced other than in full. The calibration certificate without signature and seal are not valid.

Ștampilă

Seal



Data

Date of issue

04.12.2018

Manager tehnic

Technical manager

MP. elz

SC METROLOGIE PDV SRL – LABORATOR DE METROLOGIE, Bucuresti
str. Margeanului, nr. 38, bloc M101, sc. 1, ap. 7, etaj 2, sector 5
Punct de lucru: Videle, str. Intrarea Tineretului, nr. 3, jud. Teleorman
Contact: tel./fax 0247.453577; 0347.405716.
Adresa email: metrologie_pdv@yahoo.com

CERTIFICAT DE ETALONARE nr. 120-2018

Page 2 of 2

Calibration Certificate

Descriere obiect: (Object description)	interval: NO (0...20) ppm ; NO ₂ (0...20) ppm ; NH ₃ (0...1) ppm eroare tolerată: ± 3 %
Metoda de etalonare: (Calibration method)	Comparare directa conform procedurii cod: PE 16.00
Etalonul utilizat/nr. CE: (Measurement standards)	MRC: NO/N ₂ (20,01 ± 0,16) ppm, butelia seria 3904596; NO ₂ /N ₂ (9,77 ± 0,10) ppm, butelia seria 3843121 ; NH ₃ /N ₂ (1,00 ± 0,10) ppm, butelia seria 362561, conform certificatului nr. Linde-CRM-0387, trasabilitate DakKS.
Condiții de măsurare: (Measurement conditions)	- temperatura mediului ambiant: 21 °C; - umiditatea relativă: 51 % rH; - presiunea atmosferică: 1010 hPa.
Condiții de referință: (Reference environmental conditions)	- temperatura mediului ambiant: (18...25) °C; - umiditatea relativă a aerului: (50 ± 20) % rH; - presiunea atmosferică: (860...1060) hPa.
Reglarea obiectului: (Instrument adjustment)	-

Rezultatele etalonării:
(Calibration results)

Gazul a cărui concentrație se măsoară	Valoarea medie a concentrațiilor indicate	Valoarea corecției	Incertitudinea de măsurare
NO	19,92 ppm	+ 0,09 ppm	0,40 ppm
NO ₂	9,63 ppm	+ 0,14 ppm	0,19 ppm
NH ₃	0,97 ppm	+ 0,03 ppm	0,15 ppm

1 ppm = 1 x 10⁻⁶ mol/mol**Incertitudinea de masurare**
Measurement uncertainty

Incertitudinea declarata este incertitudinea extinsa obtinuta prin multiplicarea incertitudinii standard a masurarii cu factorul de acoperire k = 2 care, pentru o distributie normala, corespunde la un nivel de incredere de aproximativ 95%
(The uncertainty stated is the expanded uncertainty, obtained by multiplying the standard uncertainty by the coverage factor k=2, which for a normal distribution corresponds to a confidence level of approximately 95 %.)

Conformitatea cu o specificatie
Compliance with a specification

Nota : Rezultatele etalonarii se refera numai la obiectul etalonat.
Note: The calibration result refers only to the object to be calibrated.

Executant etalonare

Person performing the calibration

**Incheierea certificatului de etalonare**
End of calibration certificate