



## EMISSIONS INDUSTRIAL ANALYZERS





## CHEMIST SERIES for Industrial Emissions Analysis

Our team is committed to provide the most suitable & custom version of any instrument to match almost any application & need. Standards regulating exhaust gas emissions in industrial systems are also becoming more and more strict, being of great relevance for both climate and health protection

In high intensity and high resources consuming processes, great quantities of toxic gases are produced, such as carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) or sulfur dioxide (SO<sub>2</sub>).

Often performed in extreme environments, featuring high levels of humidity, high temperatures and presence of particulate matter coming from combustion gases, the emissions measurements are needed in order to verify the measure and the quality of the combustion. The analyses are typically performed by special laboratories, maintenance technicians of industrial plants or by the industries themselves.

In order to answer these needs, Seitron has developed a line of industrial emissions analyzers, either portable for periodical measurements or fixed for continuous analysis.

The CHEMIST 600 and CHEMIST 600 BE GREEN are compact, hand-held instruments, which can measure up to 6 different gases, which can be customized based on the type of application.

The analyzer CHEMIST 900 offers the maximum flexibility as it incorporates both NDIR and electro-chemical technologies, which allow for the measurement of up to 12 different gases, all in a convenient portable format.

The analyzer CHEMIST 900 RACK is the instrument dedicated to the continuous measurement of industrial emissions. Thanks to its rack mounting, it is ideal for research and development environments as well as process monitoring.



## Applications



**Chemical Industries**



**Laboratories**



**Biogas Factories**



**Industrial Motors**



**Industrial Burners**



**Waste-to-energy Plants**



**Pellet Boilers**



**Industrial Cement Furnaces**



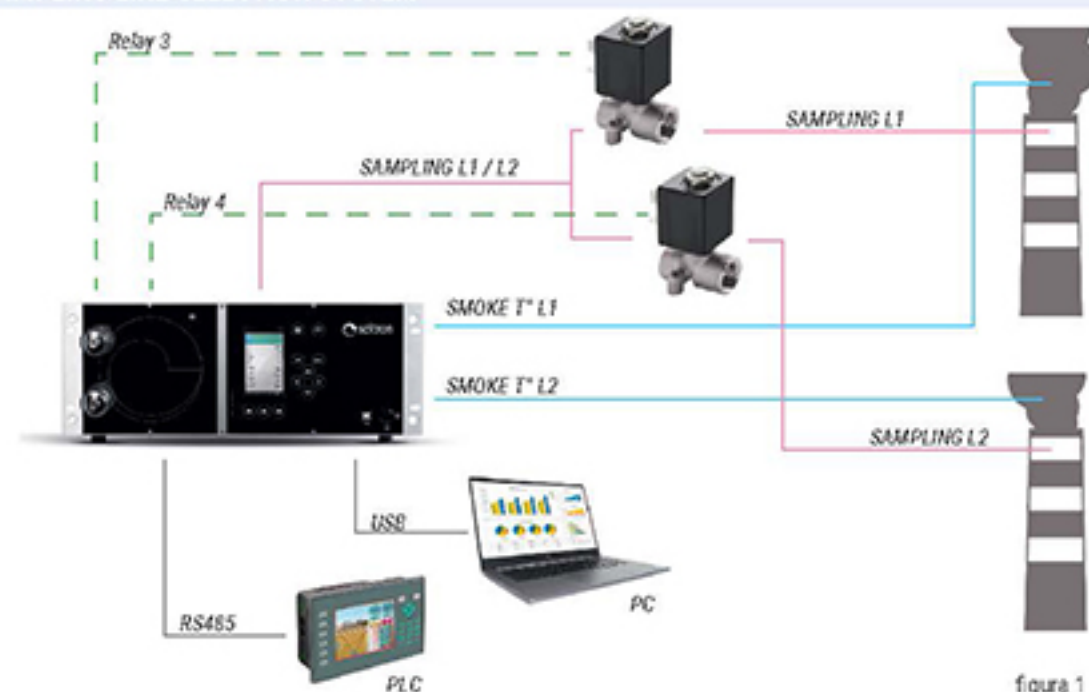
## CHEMIST 900 RACK 1-6 SENSORS

### INDUSTRIAL EMISSIONS ANALYZER

The CHEMIST 900 RACK is an onsite continuous emissions monitor (CEM). This device can measure emissions generated by industrial combustion or transformation processes and it analyzes different gases thanks to the NDIR and electrochemical technology.

Combustions and emissions parameters are displayed in real time on a TFT color display, on a PC Software or on a PLC that receives data via RS485 serial connection. The sensors are thermally compensated in order to avoid measurement errors that could be caused by temporary thermal variation. The distinctive feature of the Chemist 900 Rack is its rack structure that allows to use it into standard 19" cabinet or even in laboratories because it comes standard equipped with 4 rubber bumpers. The Chemist 900 Rack is designed to perform long-lasting analyses periods thanks to an automatic commutation system that allows to reset both the gas sensors and the pressure sensor used for draft measures or differential pressure measures. This, together with a Pitot tube, allows measure the smoke speed inside the evacuation duct. A relevant feature of the Chemist 900 Rack is a cooling system that causes a quick condensation of the moisture contained in the gas thus allowing the gas to reach the sensors without dissolving in water. The gases that benefit from this system are NO<sub>2</sub>, SO<sub>2</sub>, NH<sub>3</sub>, H<sub>2</sub>S. Condensation water is collected into a water tank and emptied on a timed basis by a membrane pump. The gas sample and the air used for sensors cleaning are filtered by two interchangeable dust filters. The Chemist 900 rack is equipped with a system that allows taking in gases from two different points (e.g. two stacks) and carry them into a single smoke suction line (image 1). All parameters and collected data are sent via serial communication port type RS485 and USB communication port in order to connect to the PC for the analysis reading. The user can archive and analyze the collected data with the dedicated software provided with the instrument, Chemist Smart Analysis. Files are saved with .csv extension.

#### SAMPLING LINE SELECTION SYSTEM



#### THE INSTRUMENT CONSISTS OF:

- Gas sampling system
- USB cable,
- Power supply cable
- UE/Schuko/USA plug
- Calibration certificate
- Instructions manual

#### Predisposto per:

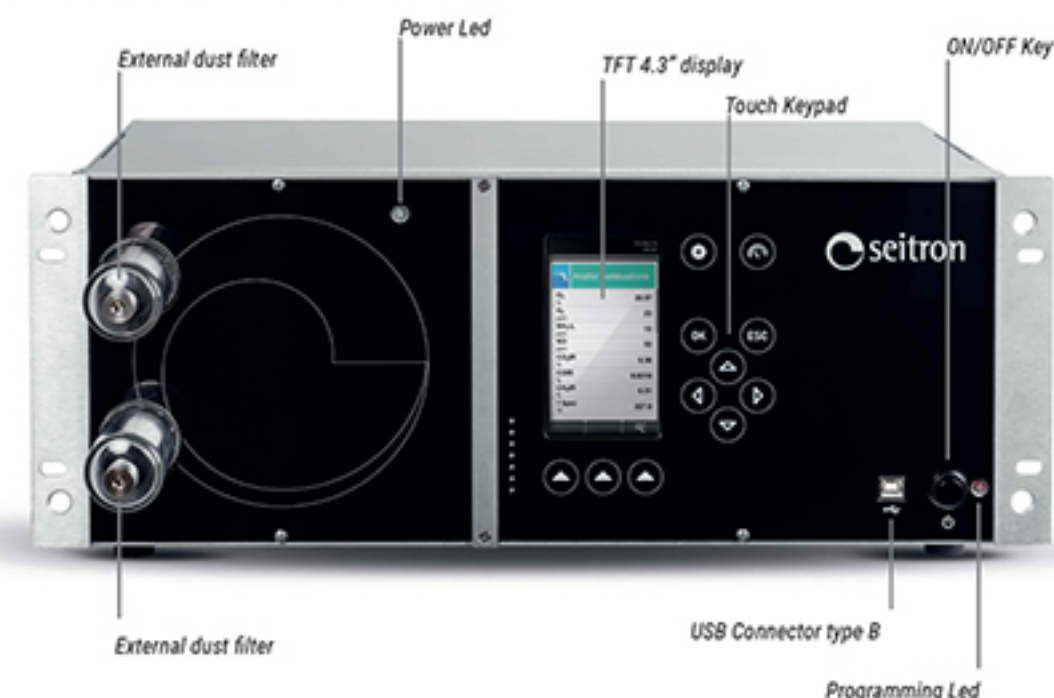
- Water trap system/cyclone cooling with Peltier sensor
- Installation with 1 to 3 sensors for "flex" electrochemical gases
- NDIR bench to measure up to 3 gases
- Gas sampling probe (with or without heated head)

#### MAIN FUNCTIONS

- Serial communication port type RS485 according to protocol MODBUS® RTU USB Communication
- Possibility of communication on ethernet line with external module
- 4 .. 20 mA isolated output
- 4 alarm relays outputs
- Heated Sampling Probes
- Efficiency calculations
- Condensing efficiency calculation
- PCI efficiency calculation
- PCS efficiency calculation
- 15 default fuels
- 32 settable fuels
- CO sensor protected by an automatic dilution system

#### MEASUREMENT

- NDIR bench (measuring up to 3 gases)
- Electrochemical gas measurement sensors (up to 3)
- Smoke temperature measurement (2 temperatures)
- Local or remote combustion air measurement
- Sensors temperature measurement through thermal compensation
- Draft in the stack with automatic autozero
- Measurement of the differential pressure
- Air speed for air or flue gas leaving the stack with the use of Pitot tube
- Suction pump flow rate measurement

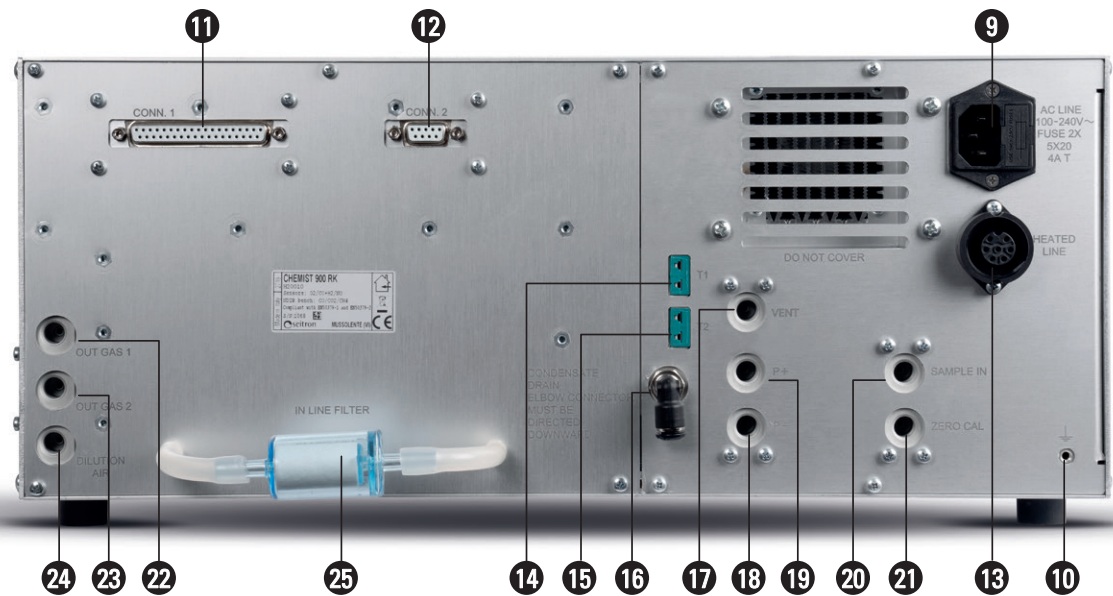


#### NDIR benches available for simultaneous measurement up to 3 gases:

Gas	Measure type	Range	Resolution	Response Time (t 90)
CO	NDIR	0 .. 2500 ppm 2500 .. 100000 ppm (10% Vol) 100000 .. 500000 ppm (50% Vol)	1 ppm 10 ppm 100 ppm	< 10 sec
CO2	NDIR	0 .. 50 % Vol	0,1 % Vol	< 10 sec
CH4 *	NDIR	0 .. 100 % Vol	1 ppm	< 10 sec
HC (C3H8)*	NDIR	0 .. 30000 ppm	1 ppm	< 10 sec

(\*) : The NDIR bench always measures the 3 gases CO, CO<sub>2</sub>, HC (ref. to methane CH<sub>4</sub>) or HC (ref. to propane C<sub>3</sub>H<sub>8</sub>)

BACK COVER DESCRIPTION



9. Power Supply 'AC LINE - 90 .. 264V-'

Plug IEC C14 to connect the power cable to the instrument, provided with the instrument itself. On the plug there is a fuse-holder hidden under a flap, containing 2 fuses 5x20 4A T.

10. Connection for grounding of the instrument.

**11. 37 poles connector (4 outputs 4..20mA and 4 relay outputs)**  
Makes available for the user 4 4..20mA outputs and 4 relay outputs with potential free change over.

12. Serial connector RS485

Serial communication port type RS485 according to MODBUS® RTU protocol.

13. 'HEATED LINE' Connector

Plug for the heated line connection.

14. 'T1' Connector

Tc-K connector to plug in the male connector Tc-K of the probe for the measure of the smoke temperature.

15. 'T2' Connector

Tc-K connector to plug in the male connector Tc-K of the combustion air probe.

16. Condensation water drain

17. 'VENT' Connector - Female connector M5

Air vent used by the pressure sensor to perform the self-zeroing. If the instrument is installed on a rack or in pressurized environments, the air vent must be moved remotely at room temperature.

18. Pneumatic connector 'P-' - female connection 1/8 GAS BSPP.

Negative input (P-) to be used for the draft measurement.

19. Pneumatic connector 'P+' - female connection 1/8 GAS BSPP.

Positive input (P+) to be used for the measurement of the pressure in general.

20. Pneumatic connector 'SAMPLE IN' - female connection 1/8 GAS BSPP.

Input for the connection of the gas sampling probe.

21. Pneumatic connector 'ZERO CAL' - female connection 1/8 GAS BSPP.

Input for the line connection to the remote air vent in order to perform the self-zeroing. If the instrument is placed in a closed and polluted environment, it is possible to move the instrument air vent in a room with clean air using the 'ZERO CAL' connector

22. Connector 'OUT GAS 1' - female connection 1/8 GAS BSPP.

Analyzed gas remote output.

23. Connector 'OUT GAS 2' - female connection 1/8 GAS BSPP.

Analyzed gas remote output.

24. Connector 'DILUTION AIR' - female connection 1/8 GAS BSPP.

Remote air vent for CO dilution.

25. Dust filter for NDIR (infrared) bench protection

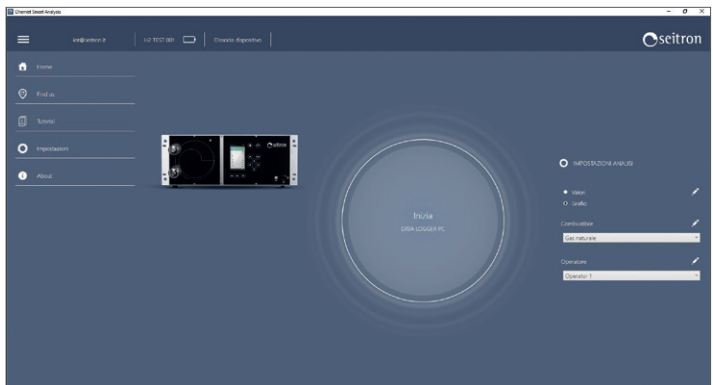
Technical Features

Power supply	90 .. 264 Vac
Power absorption at 230 V	100 VA
Display	TFT 4.3", 272 x 480 pixels graphic color with backlight
PC Communication port	USB Connector type A
Connectivity	USB-RS485 MODBUS RTU
Autozero	Automatic autozero cycle with the probe inserted in the chimney
Suction pump	2,2 l/min head at the stack up to 300 hPa.
Line Filters	Replaceable cartridge, 95% efficiency with 20um particles
Sample treatment	Peltier cooling system with automatic emptying of the condensation water
Size	19" / 4 HE / 400 mm
Operation temperature	+0°C + 45°C
Stock temperature	-20°C + 60°C
Alarm relay	4 x SPDT AC/DC 24 V 1A
Protection fuses	2 x 4A 5 x 20 T
Analog Outputs	4 x 4-20 mA max resistance load 1 KOhm
Gas 1, Gas 2 Output Connector	1/8 BSPP
Gas Input Connector	1/8 BSPP
Pressure P1, P2 Input Connector	1/8 BSPP
Condensate drainage Output Connector	1 / 8 BSPP - fast connection tube 6 mm diameter
Air Connector	1/8 BSPP
Compliant with European Standards	EN 50270, EN 50379-1 ed EN 50379-2
Compliant with USA Standard	CTM030 and CTM034

Chemist Smart Analysis

Dedicated PC Software that allows:

- Manual analysis
- Periodic data logger parameters set up (autozero time, autozero range, stand-by time, sampling range, number of analysis cycles, start and end date of the analysis)
- Pump control
- Graphical or numerical visualisation of the parameters
- Alarms visualisation
- Instrument parameters set up
- Fuels set up
- Alarms set up
- 4-20mA channels set up
- Operator data set up
- CSV files data storing




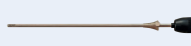








## Gas Analysis Probes

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AASF51A		180 mm flue gas sampling probe, cable length 2m, maximum temperature 400 ° C, without anti-condensation unit	✓		
AASF62A		300 mm flue gas sampling probe, cable length 3m, maximum temperature 600 ° C, without anti-condensation unit	✓		
AASF65A		750 mm flue gas sampling probe, cable length 3m, maximum temperature 800 ° C, without anti-condensation unit	✓		
AASF66A		1000 mm flue gas sampling probe, cable length 3m, maximum temperature 1200 ° C, without anti-condensation unit	✓		
AASL05A		300 mm flue gas sampling probe, cable length 2m, maximum temperature 600 ° C, without anti-condensation unit	✓		
AASF31		180 mm flue gas sampling probe, cable length 3m, maximum temperature 400 ° C		✓	✓
AASF32		300 mm flue gas sampling probe, cable length 3m, maximum temperature 600 ° C		✓	✓
AASF35		750 mm flue gas sampling probe, cable length 3m, maximum temperature 600 ° C		✓	✓
AASF36		1000 mm flue gas sampling probe, cable length 3m, maximum temperature 1200 ° C		✓	✓





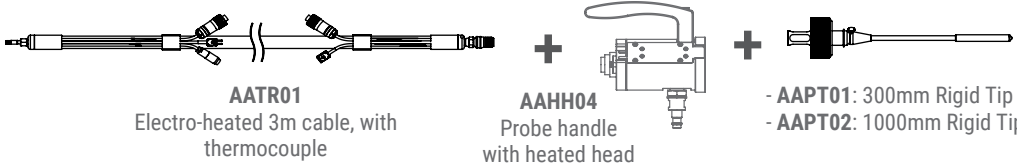
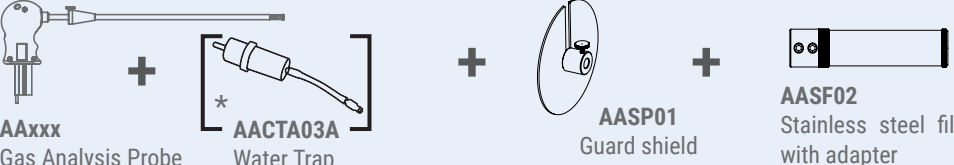
## Modular Probes

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AAPT07		300mm flexible tip (*). Measuring range temperature 130°C - for AASJ02 / AASJ03 / AASJ05 handle	✓	✓	✓
AAPT08		180mm rigid tip (*). Temperature measurement range 400°C - for AASJ02 / AASJ03 / AASJ05 handle	✓	✓	✓
AAPT09		300mm rigid tip (*). Measuring range temperature 600°C - for AASJ02 / AASJ03 / AASJ05 handle	✓	✓	✓
AAPT10		750mm rigid tip (*). Temperature measurement range 800°C - for AASJ02 / AASJ03 / AASJ05 handle	✓	✓	✓
AAPT11		1000mm rigid tip (*). Temperature measuring range 1200°C - for AASJ02 / AASJ05 handle	✓		
AASJ02		Flue gas suction probe handle; without ferrule. Cable: 3 m. Fitting diameter 9 mm, without anti-condensation unit	✓		
AASJ03		Flue gas suction probe handle, without tip, rubber hose length 3 m. Fitting diameter 9 mm, without anti-condensation unit		✓	✓
AASJ05		Flue gas suction probe handle; without ferrule. Cable: 1,8 m. Fitting diameter 9 mm, without anti-condensation unit	✓		

Accessories for Residential Applications


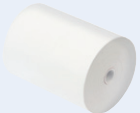

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AACKP01		Pressure Differential measurement kit 2 x 1 m hoses + fittings	✓	✓	✓
AACT001		Silicone conical fitting 44 - 22 mm	per kit prova tenuta		
AACT002		Silicone conical fitting 32 - 18 mm	per kit prova tenuta		
AAKT05		Kit for tightness test with 4 ways manifold, manual pump, 100 ml syringe, hoses, 1 silicone conical fitting	✓	✓	
AARA01		Threaded 9 mm diameter fitting, 1/4" gas coupling, 1/4" to 1/8" gas nipple (for tightness test)	per kit prova tenuta		
AARA02		Gas valve hose adapter: d.i. 7 mm	✓		
AASA08		Outdoor air temperature 200 mm TcK probe, with 2 m cable	✓		
AASG01		Gas sniffer probe for Chemist 500 analyzers 1 m + fitting	✓		
AATT01		"L" shaped Pitot Tube. 300 mm length, 6 mm external diameter. Without thermocouple	✓	✓	✓
AATT02		"L" shaped Pitot Tube. 800 mm length, 6 mm external diameter. Without thermocouple	✓	✓	✓

Accessories for Industrial Applications

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AACEX01		3 m extension cable for flue gas probe (code AASFxxx)	✓	✓	✓
AAPM02		Bacharach hand Pump for carbon measurements	✓	✓	✓
AACE01		Active external cooler (compatible with AASF3xx probes)	✓		
Automatic Carbon Measurement Probe		 AASY01: Handle with 3,5m cable + AAPT04 750 mm Rigid Tip		✓	
Probe with electro-heated head and tube		 AATR01 Electro-heated 3m cable, with thermocouple + AAHH04 Probe handle with heated head + AAPT01: 300mm Rigid Tip - AAPT02: 1000mm Rigid Tip		✓	✓
Accessories for industrial measurements, high temperatures and particularly dirty smokes		 AAxxx Gas Analysis Probe + AACTA03A Water Trap + AASP01 Guard shield + AASF02 Stainless steel filter with adapter	✓	✓	✓

\* : If not included in the probe AASFxxx

PRINTERS AND CONSUMABLES

CODE	PHOTO	DESCRIPTION	CHEMIST 500 BG	CHEMIST 600	CHEMIST 600 BG	CHEMIST 900
AARC09		Long life plain thermal paper roll 57x35 (for thermal printer AAST04)	✓		✓	
AARC10		Long life plain thermal paper roll 57x30		✓		✓
AAST04		Thermal printer with Bluetooth connection	✓		✓	

SPARE REPLACEMENT PARTS

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AAPB01		Rechargeable Li-Ion battery, 3,7 V, 4,8 Ah	✓		
AAPB12		Rechargeable Li-Ion battery; 11,6V - 6200mAh		✓	
AAKA02		Power Adapter with international plug, USB A / USB B with 2 m cable	✓		
AACFA01		Fine dust filters for AACTA03 (5 pcs. package) Dimensions 12x32 mm	✓		
AACTA03A		Water trap with dust filter, stainless steel fittings and silicon hose suitable for all combustion analyzers	✓		
AAFA02		Spare Part Filter; dimensions 12x57mm; (2PCS)		✓	✓
AAFA03		HDPE filter for industrial engine probe (2PCS); dimensions 12x32mm; suggested use for NH3 measurements with passive probes	✓		
AAFA04		HDPE filter for industrial engine probe (2PCS); dimensions 12x57mm; suggested use for NH3 measurements with passive probes		✓	✓
AAFS01		Inox filter for industrial engine probe; dimensions 12x57mm (AAFS02 Spare Part)	✓	✓	✓

CASE, HOLSTER AND ACCESSORIES

CODE	PHOTO	DESCRIPTION	CHEMIST 600/600 BG	CHEMIST 900	CHEMIST 900 RACK
AACR10		Hard plastic kit case	✓		
AASM06		Rubber holster	CHEMIST 600		
AASM10		Rubber holster	CHEMIST 600 BG		
AAEB01		Trunk Extension - Chemist 900		✓	
AATY01		Trolley for Trunk - Chemsit 900		✓	

CALIBRATION CERTIFICATE

COD	DESCRIPTION
CER012	ISO 9001 calibration certificate for 2 sensors analyzers: Gamma Chemist
CER013	ISO 9001 calibration certificate for 3 sensors analyzers: Gamma Chemist
CER 014	ISO 9001 calibration certificate for 4 sensors analyzers: Gamma Chemist 500 e 500 BE GREEN
Calibration certificates on analyzers with more than 4 sensors can be performed by request.	

To ensure your and your customers' safety, please remind that the current legislation imposes that all measuring instruments must be calibrated by a lab and certified every 12 months.

UNI 10389-1:2009 – Combustion analyzers

UNI 11137:2019 – Manometers and analyzers in use also for gas plants leak tests

UNI 10845:2018 – Manometers and analyzers in use also for open chamber boilers draft

MAINTENANCE CONTRACTS

COD	DESCRIPTION
CON009	Annual maintenance contract for 2 sensors analyzers: Gamma Chemist
CON010	Annual maintenance contract for 3 sensors analyzers: Gamma Chemist
CON011	Annual maintenance contract for 4 sensors analyzers: Gamma Chemist



GAS SENSORS

GAS	CODE	RANGE	GAS SENSOR	RESOLUTION	ACCURACY	CHEMIST 600/600 BG	CHEMIST 900/900 RACK
O2 Long Life	AACSE44	0...25% v/v	Electrochemical sensor	0.1% vol	±0.2% vol	✓	✓
CO / H2	AACSE12	0...8000 ppm	Electrochemical sensor	1 ppm	±10 ppm ±5% ±10%	✓	✓
CO / H2 Low Range	AACSE24	0...1000 ppm	Electrochemical sensor	0.1 ppm	±2 ppm ±5%	✓	✓
CO	AACSE17	0...10.00% Vol (100.000 ppm)	Electrochemical sensor	0.01% vol	±0.1% vol ±5%	✓	✓
CO	AACSE18	0...20000 ppm	Electrochemical sensor	1 ppm	±100 ppm ±5% ±10%	✓	✓
CO2	AACSE47	0...50% v/v	NDIR Sensor	0.1% vol	±1% ±2%	✓	✓
NO	AACSE10	0...5000 ppm	Electrochemical sensor	1 ppm	±5 ppm ±5%	✓	✓
NO Low Range	AACSE25	0...500,0 ppm	Electrochemical sensor	0.1 ppm	±2 ppm ±5%	✓	✓
NO2	AACSE14	0...1000 ppm	Electrochemical sensor	1 ppm	±5 ppm ±5%	✓	✓
NO2 Low Range	AACSE26	0...500,0 ppm	Electrochemical sensor	0.1 ppm	±2 ppm ±5%	✓	✓
SO2	AACSE13	0...5000 ppm	Electrochemical sensor	1 ppm	±5 ppm ±5%	✓	✓
SO2 Low Range	AACSE28	0...500,0 ppm	Electrochemical sensor	0.1 ppm	±2 ppm ±5%	✓	✓
CH4	AACSE73	0...100% v/v	NDIR single band Sensor	0,01% Vol	0-10% 10%-100%	✓	
CxHy	AACSE39	0...5.00% Vol CH4	Pellistor sensor	0.01% vol	±0.25% vol	✓	✓
H2	AACSE57	0...2000 ppm	Electrochemical sensor	1 ppm	± 10 ppm ± 10 %	✓	✓
H2S	AACSE72	0...5000 ppm	Electrochemical sensor	1 ppm	+/- 5ppm +/- 5% m.v. +/- 10% m.v.	✓	✓
H2S Low Range	AACSE35	0...500,0 ppm	Electrochemical sensor	0.1 ppm	±5 ppm ±5% m.v.	✓	✓
NH3	AACSE56	0...500,0 ppm	Electrochemical sensor	0.1 ppm	+/-10ppm +/-10% m.v.	✓	✓