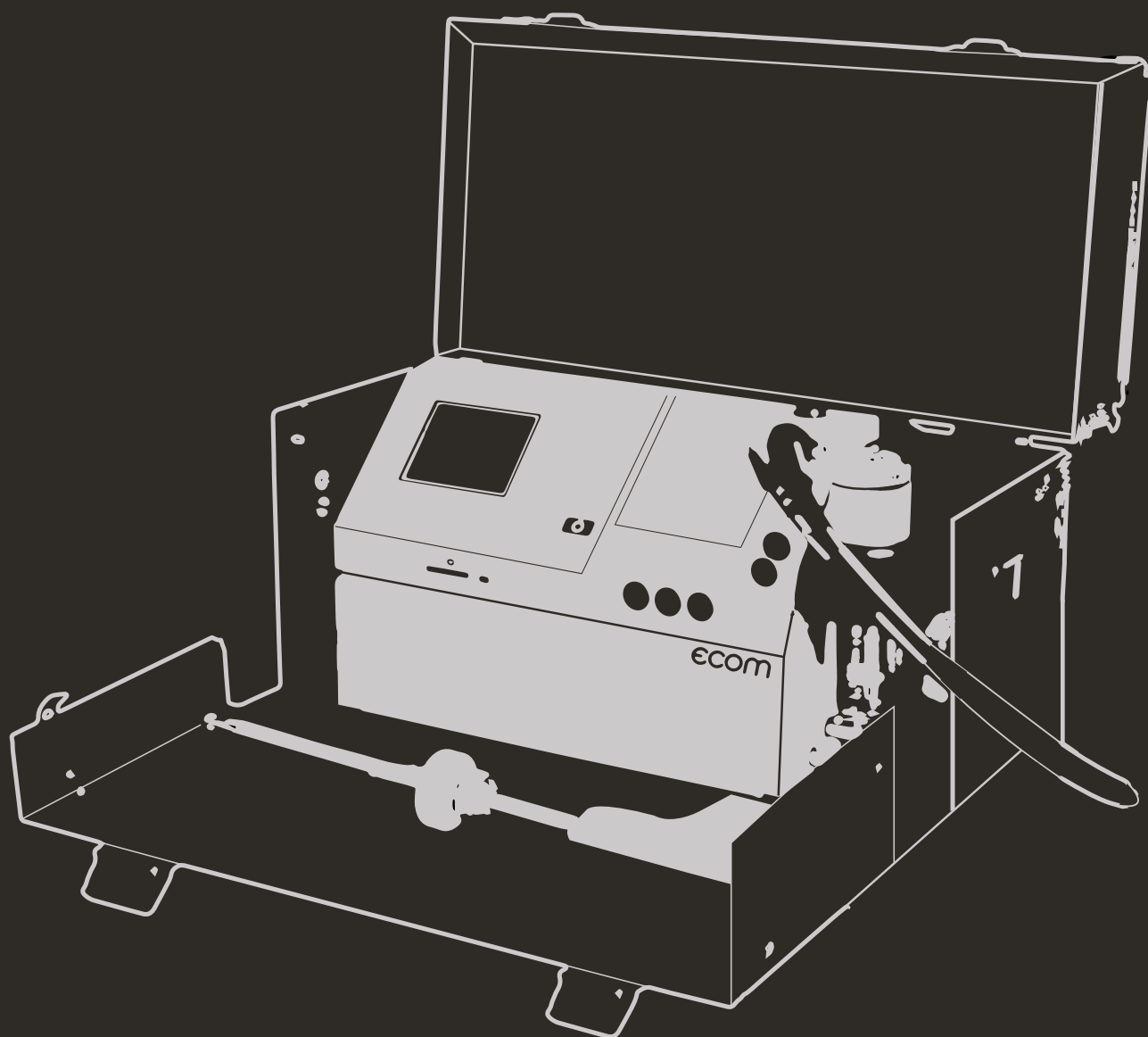


The robust case instrument for fast and efficient measurements during control and adjustment works

# ecom<sup>®</sup> EN3



# ecom PRODUCTS OFFER YOU MANY BENEFITS...



## EXTREM EFFICIENT.

The high output level (up to 2.6 liters/minute) not only enables ecom analyzers to provide a fast reading: It also makes it possible to bridge long distances during sampling, or negative pressure in the application. Manometers also provide readings in record time.



## EXTREM ACCURATE.

The reading accuracy of gas sensors (CO, NO, SO<sub>2</sub>) is determined and adjusted at 5, 20 and 40°C in the climatic test chamber using standardized test gases. High-quality sensors provide a perfect reading for pressure measurements.



## EXTREMELY COMPLETE.

ecom analyzers are sold and designed as an entity (device, probe, probe hose, case). In addition: Printer paper and filter, a solid shoulder strap, PC software and Apps.



## EXTREMELY COOL.

The drier, the better: The gas to be measured is continually cooled to 5°C using a gas cooler. This way, the drying process is controlled. Collected condensate can be easily emptied in some cases this occurs in automatic mode.



## EXTREMELY FAR-REACHING.

ecom analyzers communicate wirelessly: Via Bluetooth as well as radio (highest range with the most stable connection). This way instruments can be remote-controlled via e.g. smartphones or ecom remote control unit.



## EXTREMELY ROBUST.

Hard on the outside - even harder on the inside! Almost all ecom measuring devices are housed in an ultra-light aluminium casing. Its durability pays off in its daily use - especially in rougher conditions.



## EXTREMELY SAFE.

The condensation control protects from moisture. An automatic CO shut-off (flushing of the CO sensor) without interruption of the measuring process ensures the long lifespan of the CO sensor. Each ecom instrument has its own „safety equipment.“



## EXTREMELY LOSS-FREE.

To measure the full concentration of extremely water soluble gases an inner PTFE coated hose or a heated sampling system are available. This guarantees the fast and condensate free flue gas transport.

## ...BY EVERY APPLICATION.



### HEATING

Combustion gas analysers, pressure meters, leak detectors and more for the HVAC handicraft, chimney-sweep and heating after-sales service. For control and adjustment works in order to reduce emissions and to optimize the efficiency of heating plants.

### ENGINES

For control and adjustment works among all by commissioning of gas engines, thermal power blocks, etc. as well for the perfect measurement of water-soluble gases like nitrogen oxide – especially recommended for the NO<sub>x</sub> measurement.

### COMBUSTION

Combustion gas analysers, pressure meters, leak detectors and more for control and adjustment works at burners and large-scale firing plants in order to reduce emissions, to arrange for a more efficient combustion process and to optimize the thermal process.

### INDUSTRY

Combustion gas analysers, pressure meters, leak detectors and more for the perfect preparation of water-soluble gases (i.a. NO<sub>2</sub> and SO<sub>2</sub>) by industrial applications (like e.g. aluminium process, coke oven plants, cement processing, power plants, refineries, waste incineration...).

# Overview of technical data

√ Standard • Option x not possible

Flue gas analyser model			EN3/-R	EN3-F	
Gas Components		Resolution	Accuracy	max. 6	max. 6
O <sub>2</sub>	O <sub>2</sub> (0 - 21 vol.%) - electrochemical	0,01 vol.%	± 0,3 vol.%	√	√
CO	CO (H <sub>2</sub> -komp. 0 -10.000 ppm) - electrochemical	1 ppm	± 20 ppm or 5 % of reading**	√	√
	CO (n. H <sub>2</sub> -komp. 0 -20.000 ppm) - electrochemical	1 ppm	± 40 ppm or 10 % of reading**	•	•
	CO% (0 -63.000 ppm) - electrochemical	5 ppm	± 100 ppm or 10 % of reading**	•	•
CO <sub>2</sub>	CO <sub>2</sub> (0 - 20 vol.%) - NDIR* sensor	0,01 vol.%	± 0,5 vol.% or 5 % of reading**	•	•
	CO <sub>2</sub> (0 - 100 vol.%) - NDIR* sensor	0,01 vol.%	up to ± 5 % of measur range endvalue	•	•
NO <sub>x</sub>	NO (0 - 5.000 ppm) - electrochemical	1 ppm	± 5 ppm or 5% of reading**	•	•
	NO <sub>Low</sub> (0 - 300 ppm) - electrochemical	0,1 ppm	± 2 ppm or 5 % of reading**	•	•
	NO <sub>2</sub> (0 - 1.000 ppm) - electrochemical	1 ppm	± 5 ppm or 5 % of reading**	•	•
	NO <sub>2Low</sub> (0 - 100 ppm) - electrochemical	0,1 ppm	± 5 ppm or 5 % of reading**	•	•
	NO <sub>x</sub> - measuring - electrochemical			via NO/NO <sub>2</sub>	via NO/NO <sub>2</sub>
SO <sub>2</sub>	SO <sub>2</sub> (0 - 5.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
	SO <sub>2</sub> (0 - 5.000 ppm) - electrochemical Low CO	1 ppm	± 10 ppm or 5 % of reading**	•	•
H <sub>2</sub>	H <sub>2</sub> (0 - 2.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
	H <sub>2</sub> (0 - 20.000 ppm) - electrochemical	1 ppm	± 100 ppm or 5 % of reading**	•	•
H <sub>2</sub> S	H <sub>2</sub> S (0 - 1.000 ppm) - electrochemical	1 ppm	± 10 ppm or 5 % of reading**	•	•
	H <sub>2</sub> S (0 - 5.000 ppm) - electrochemical	1 ppm	± 50 ppm or 5 % of reading**	•	•
C <sub>x</sub> H <sub>y</sub>	C <sub>x</sub> H <sub>y</sub> (0 - 4 vol.%) - catalytic	0,01 vol.%		•	•
	CH <sub>4</sub> (0 - 5 vol.%) - NDIR* sensor	0,01 vol.%	± 0,2 vol.% or 5 % of reading**	•	•
	CH <sub>4</sub> (0 - 100 vol.%) - NDIR* sensor	0,1 vol.%	up to ± 5 % measur range endvalue	•	•
Additional Measurements   Display Options		Resolution	Accuracy		
T-Gas	0 - 500 °C	1 °C	± 2 °C or 1,5 % of the reading**	√	√
	0 - 1.100 °C	1 °C	± 2 °C or 1,5 % of the reading**	•	•
T-Air	0 - 99 °C	1 °C	± 1 °C	√	√
Pressure   ΔP	± 100 hPa	0,01 hPa	± 0,5 hPa or 1 % of the reading**	√	√
Calculated values					
CO <sub>2</sub> - 0 - CO <sub>2</sub> max				√	√
Combustion efficiency (ETA)				√	√
Excess air (Lambda) - > 1				√	√
Losses qA - 0 - 100 %				√	√
Dew point - x °C				√	√
mg/m <sup>3</sup> - x mg/m <sup>3</sup>				√	√
mg/KWh - x mg/KWh				√	√
O <sub>2</sub> - reference- x % O <sub>2</sub>				√	√
Gas processing					
Electronic condensation monitoring				√	√
Automatic condensation evacuation				•	√
Electronic gas cooler				•	√
Operation safety					
Temperature trend indication for core stream search				√	√
CO switch-off				√	√
Fresh air purge by CO exceeding				√	√
Fresh air purge after operation				√	√
Flow meter for pump performance control				√	√
Sampling system					
Unheated probe, type SCD				•	x
Unheated probe, type SU				x	•
Heated probe, type SB				•	•
Gas transportation (tubing)					
Multi-chamber silicone tubing				√	√
NO <sub>x</sub> / SO <sub>x</sub> special tubing with PTFE inner coating				•	•
Printer					
Thermal quick-printer, integral				√	√
Data processing					
Serial interface for data transfer				√	√
USB interface for data transfer				√	√
Wireless data interface (e.g. for connection to a smartphone or tablet)				√	√
Data recording on multimedia card				•	•
Reception possibility for diagnosis data from ecom-AK				√	√
Remote control					
via backlit keypad				√	√
via smartphone/tablet (free iOS + Android app)				√	√
Transport					
Aluminum-framed transport case				√	x
Under case				•	x
Hardtop transport case				x	√

# ecom<sup>®</sup> EN3

## FLUE GAS ANALYSIS



### ecom-EN3

#### COMPACT FLUE GAS ANALYZER

- O<sub>2</sub> / CO (H<sub>2</sub>-comp.) Longlife sensors
- Up to 6 sensors possible
- CO sensor overload protection without measurement interruption
- Condensate trap with electronic condensation monitoring
- Brushless high-performance gas pump
- With sampling probe (220 mm, Ø 8 mm), thermocouple, fixation cone and 3-chamber sampling tubing (3 m)
- T-Room sensor with cable, fixation cone and fixation magnet
- Integrated thermal fast printer
- Fitted in aluminum-framed transport case with comfort carrying strap
- Complete in ultralight aluminum housing
- TFT color display and backlit keypad
- Powerful Lithium-Ion battery
- Mains charger with protective pouch (battery charging also possible by closed case)
- LED flow display
- Calibration certificate
- Wireless data interface (e.g. for connection to a smartphone or tablet)

**Dimensions (W x H x D)** 400 x 275 x 205 mm

**Weight** approx 7 kg (complete with sampling system)

### ecom-EN3-R

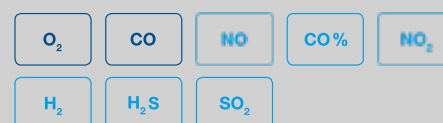
#### WITH INTEGRAL SOOT MEASUREMENT

- Heatable soot probe (250 mm, Ø 10 mm) with thermocouple, fixation cone and 3-chamber sampling tubing 3 m

#### ADDITIONAL OPTIONS

- NO sensor
- CO% sensor
- SO<sub>2</sub> sensor
- H<sub>2</sub> sensor
- Gas flow measurement
- NO<sub>x</sub> tubing
- Mini gas cooler

#### Measurable Gases



● = Base; ● = Optional EC



ACCURATE



ROBUST



EFFICIENT



SAFE



Testing according to DIN EN 50379-2 and 1st. BImSchV.



### ecom-EN3-F

FLUE GAS ANALYZER IN FIT TO FLY TRANSPORT CASE

- O<sub>2</sub> / CO (H<sub>2</sub>-comp.) Longlife sensors
- Up to 6 sensors possible
- CO sensor overload protection without measurement interruption
- Electronic condensate monitoring with automatic draining
- With sample gas cooler
- Brushless high-performance gas pump
- With heated sampling probe (350 mm, Ø 10 mm ), thermocouple, cone and 3-chamber sampling tubing (3 m)
- T-Room sensor with cable, fixation cone and fixation magnet
- Integrated thermal-quick-printer
- Fitted in hardtop transport case
- Aluminum housing (ultralight)
- TFT color display and backlit keypad
- Powerful Lithium-Ion battery
- Power supply + power supply bag
- LED flowdisplay
- Calibration certificate
- Wireless data interface (e.g. for connection to a smartphone or tablet)

### ecom-EN3-F EXPERT

FOR PERFECT NO<sub>x</sub> /SO<sub>2</sub>- MEASUREMENTS

- NO<sub>x</sub> version (equipped with O<sub>2</sub> / CO / NO / NO<sub>2</sub> sensors)
- Low-NO<sub>x</sub> version also possible
- With high-quality sampling probe (350 mm) including thermocouple, cone and 3-chamber NO<sub>x</sub> tubing (3.5 m)



### ecom-EN3-F ENGINE

FOR MEASUREMENTS AT CHPS AND ENGINES

- NO<sub>x</sub> version (equipped with O<sub>2</sub> / CO / NO / NO<sub>2</sub> sensors)
- Up to a total of 6 gas sensors (including SO<sub>2</sub> or IR CO<sub>2</sub> or CH<sub>4</sub> sensors)
- Preset for NO<sub>x</sub> measurements, as well as mg/m<sup>3</sup> at 5% O<sub>2</sub> reference (freely adjustable)
- Sampling probe (360 mm), NO<sub>x</sub> / SO<sub>x</sub> tubing with mini-heat protection shield on the probe cone and 2-chamber NO<sub>x</sub> tubing



#### Measurable Gases

O <sub>2</sub>	CO	NO	NO <sub>2</sub>	C <sub>x</sub> H <sub>y</sub>
H <sub>2</sub>	CO%	SO <sub>2</sub>	H <sub>2</sub> S	CO <sub>2</sub>
				CH <sub>4</sub>

● = Base; ● = Optional EC; ● = Optional NDIR; ● = Optional Pellistor

**Dimensions (W x H x D)** 550 x 185 x 380 mm

**Weight** approx 9 kg (complete with sampling system)



FAR-REACHING



COMPLETE



COOL



LOSS-FREE

# USEFUL

## ecom-AK

READOUT UNIT FOR DIGITAL AUTOMATIC BURNER CONTROLLERS

- Automatic identification of automatic burner controller type
- Readout feature for errors and operating conditions
- Built-in display
- Data transfer via cable to PC or ecom-EN3 analyzer
- Data transfer via radio to the ecom-J2KNpro control panel (display + printing via flue gas analyzer)

Displayed data:

- Display of recent and past failures
- Display of burner operating conditions
- Measurement of the flame signal/comparison with minimum value
- Checks of delayed flame development
- Detection of the number of burner starts
- Display of all relevant operating times (safety time, etc.)

**Dimensions (W x H x D)** approx. 88 x 41 x 32 mm

**Weight** approx. 322 g - incl. belt pouch



ROBUST









COMPLETE



EFFICIENT



ecom-AK will show the following display messages:

Automat DKO 972 / 22	Identification of burner controller (Honeywell-Satronic DKG, DKO, DKW, DMO, DMG, DLG, DVI, DIO, SH, SG incl. N versions as well as Siemens-Landis & Staefa LMG, LMO).
    * 2.3µA 231V	Indication of burner operating mode.
* 2.2µA  IS * 1.2µA  MIN	Measurement of flame signal and comparison with minimal value.
Rest time TSA 3.9 sec	Check if flame occurs immediately or with delays.
Current error Flame signal during straylight check !	Indication of current disturbance source as well as of 5 past disturbances.
Start-ups counter 664	Determination of burner starts.



## ecom-UNO

FOR THE ADJUSTMENT OF GAS BURNERS /GAS HEATINGS

- Device connection pressure (flow pressure)
- Nozzle pressure (flow pressure)
- Gas operating pressure (system pressure)
- Static pressure
- Switchable units: hPa / mbar, mmH<sub>2</sub>O, psi, mmHg
- Measurement range: ± 200 hPa, ± 2038 mmH<sub>2</sub>O, ± 2.9 psi, ± 150 mmHg
- Resolution: 0.01 hPa / 0.01 mmH<sub>2</sub>O / 0.01 psi / 0.01 mmHg
- Accuracy: approx. 1%
- Overload: 300 hPa / 3060 mmH<sub>2</sub>O / 4.35 psi / 225 mmHg

**Dimensions (W x H x D)** approx. 106 x 64 x 28 mm

**Weight** approx. 150 g



## ecom-LSG

DETECTION OF FLAMMABLE GASES

- Three sensitivity levels adjustable
- Accoustic signal on/off at choice
- Display range up to 0.5% vol. CH<sub>4</sub>, Response time: < 2 seconds
- Backlit bargraph
- Display approx. 20 x 7 mm
- 1-14 bars (10 bars = approx. 1000 ppm CH<sub>4</sub>)
- Warm-up time: approx. 3 minutes
- Sensor temperature compensation (-5°C to 40°C)

**Dimensions housing (W x H x D)** approx. 155 x 35 x 22 mm

**Swan-neck:** approx. 355 mm

**Weight:** approx. 200 g

## ACCESSORIES



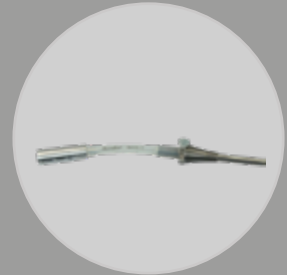
### Filter plate

Multi-level processing: water separation in condensate trap; pre filtering via fine particulate filter; silica gel drying; removal of sensor-damaging, organic compounds in the hydrocarbon filter.



### Probe prefilter

Metal filter with the smallest filter pores; ideal for preventing that solid exhaust gas components enter into the probe/the flue gas tract.



### Probe extension

For probe type Ø 8 mm, with flexible tube center piece. Is placed on the probe seats for measurements at difficult to reach, angled measuring openings.



### CO multi-hole probe

For the CO measurement of the CO concentration according to KÜO (sweeping and monitoring system) extendable from 80 to 280 mm.



### Ring slot multi-hole probe

For measurement on concentric exhaust systems. Continuously extendable (80 to 280 mm) - with three easily replaceable sealing plugs for measuring openings from Ø 5 to 25 mm.



### Contact sensor

Forerun and backrun temperature measurement.



### T-Room-probe (PT 2000)

For measuring the room or intake air temperature - for example for concentric flue gas systems.



### Soot pump set

Consisting of soot pump, soot comparison scale, piston lubricant oil, socket wrench and 200 soot test strips.



### Under case

For the storage of accessories, tools, and small devices.

Other accessories on demand.

# ecom<sup>®</sup>

improve the important

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