CORONA - The Compact Sensor Unit Specially Designed For Food Industry

At line or Laboratory Measurements of :

- Colour
- Moisture
- Protein
- Fat/Oil
- Fiber
- Sugars
- Free Fatty Acid
- Amino Acid
- Vitamins
- Carbohydrate
- Energy
- Starch
- Ash
- Minerals

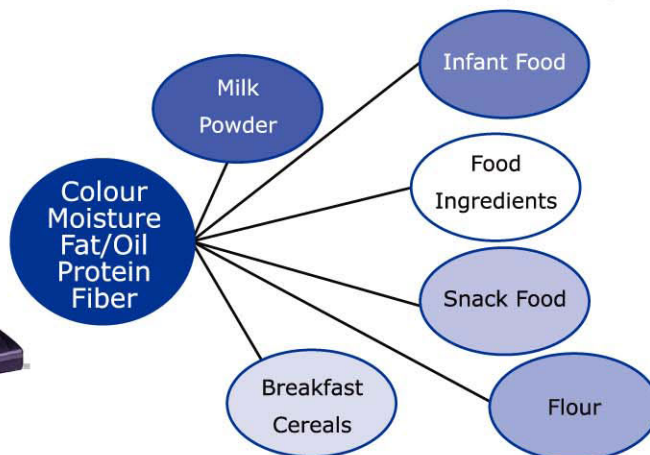# Product information

ZEISS

We make it visible.

CORONA

A versatile compact sensor unit specially designed for accurate measurement of critical parameters such as : Colour, Moisture, Fat/Oil, Protein, Fibre, Sugars,Vitamins, Carbohydrate, Energy, Starch, Amino Acid, Free Fatty Acid, Sodium, Chloride, Calcium, Potassium and Ash in the food industry to maximize productivity at target value to reduce the manufacturing costs.

Measurement and control of moisture during the food processing is critical because it affects the taste and texture of any food product quality; too much moisture results in reduced shelf-life and too little can impair the flavour. As legislation and quality issues evolve the need to measure and control parameters other than moisture increases in the food industry.

The food industry can now replace their time consuming conventional test methods and eliminate human error by using CORONA to guarantee excellent accuracy and repeatability for at-line or laboratory sample measurement. CORONA is also widely used to calibrating and checking on-line instrumentation in the food processing plant. The total elimination of moving mechanical components offers a very high degree of reliability and permanent correctness of the spectral wavelength. Hence, results in calibration transfer among the CORONA FAMILY is so simple on a *"Plug and Play"* basis.

CORONA can be used for a wide variety of measuring tasks and is poised to tackle new measuring concepts because it offers specific measuring geometry and the option of parallel detection in the UV, the Visible and the Near Infrared Wavelength Range.

Colour Moisture Fat/Oil Protein Fiber → Milk Powder, Infant Food, Food Ingredients, Snack Food, Breakfast Cereals, Flour

Software

CORONA is integrated with microprocessors to enable simple and automated operation. It also offers full networking facilities for easy integration into modern Laboratory Information Management Systems (LIMS)

CORA

The Applications Software developed by Zeiss, for the intelligent multi-functionality check as well as the control of Corona. Allows the simple and easy collection of the spectral data, on-line and off-line prediction of measurement results. The software is supported by Windows 98, 2000 and XP.

Aspect Plus

The spectrum software developed by Zeiss , provide the extensive mathematical functions for spectral analysis. The software is supported by Windows 3.11, 95, NT 2000 and XP.

Functional libraries under LabView and C/C++

The driver library used for spectral range detection and parameter administration.

Grams 32 / Unscrambler

The flexible and powerful software used for chemometric routines for the creation of calibration models.
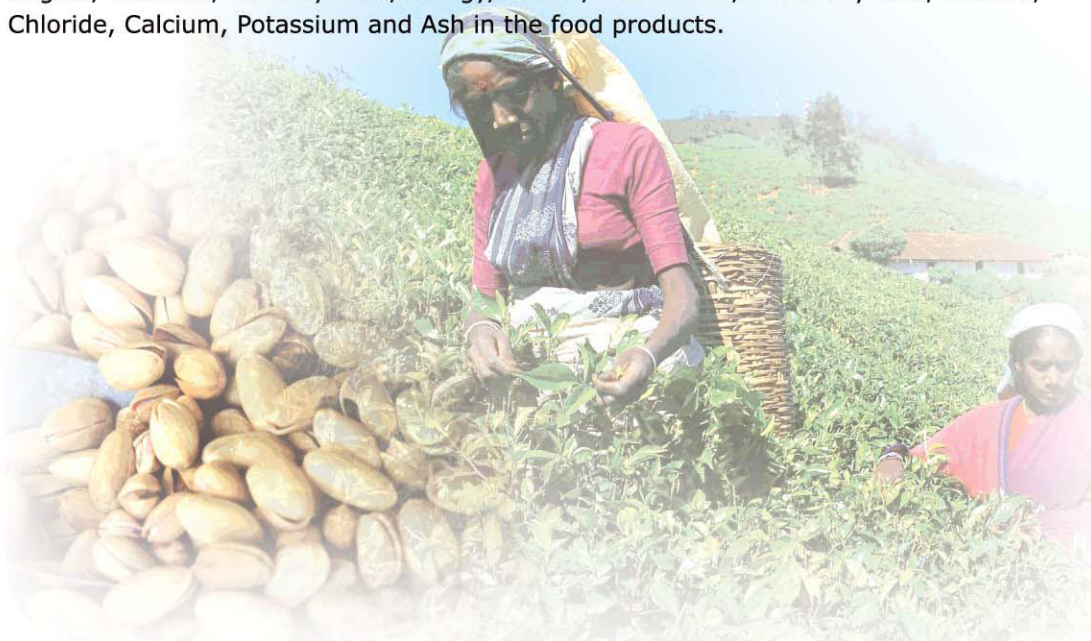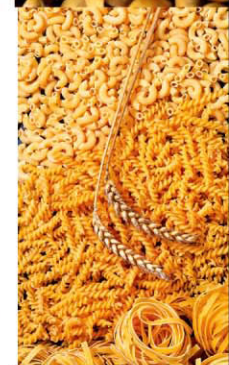
signed For Food Industry

Benefits

- Permits direct, safe, non-contact and non-destructive sample measurement. Operators no longer need to grind and prepare samples.

- Allows simultaneous multi-component analysis in less than 1 (one) minute.

- Provides fast, precise and cost-saving analysis for quality control tasks in the food industry.

- Offers "state-of-the-art" diode array technology and the "Unique Zeiss Polychromator" design. Hence, CORONA measurement is not sensitive to colour, seasonal composition and particle size changes as well as unaffected by ambient influences such as ambient lighting, temperature and humidity.

- Provides wide wavelength range, with detection possible in milliseconds. Greater speed of measurement means more representative measuring of the sample and improved accuracy.

- Robust construction offers a very high degree of reliability and permanent correctness of the spectral wavelength by eliminating moving mechanical components. Hence, CORONA is service-free and calibration transfer among the CORONA FAMILY is so simple on a *"Plug and Play"* basis.

- CORONA is configured for UV / VIS / NIR measurements as well as for reflection and transmission.

- Comprehensive software package for simple automated operation with full networking facilities for easy integration into modern Laboratory Information Management Systems (LIMS)

Applications

At Line or Laboratory Measurements of : Colour, Moisture, Fat/OIL, Protein, Fibre, Sugars, Vitamins, Carbohydrate, Energy, Starch, Amino Acid, Free Fatty Acid, Sodium, Chloride, Calcium, Potassium and Ash in the food products.

The List of Applications for Food Industry

Product	Composition													
	Colour	Moisture	Protein	Fat	Fiber	Starch	Sugar	Vitamin	Carbo-hydrate	Energy	Amino	FFA	Ca/Na/K/Cl	Ash
Milk Powder	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓
Breakfast Cereals	✓	✓	✓	✓	✓			✓	✓	✓		✓		✓
Snack Food	✓	✓	✓	✓	✓	✓			✓	✓		✓		✓
Flour	✓	✓	✓	✓	✓	✓						✓		✓
Sugars	✓	✓							✓	✓		✓		✓
Chocolate/ Cocoa	✓	✓	✓	✓			✓		✓	✓			✓	
Starch/ Potato Powder	✓	✓	✓	✓	✓	✓			✓	✓				✓
Noodles	✓	✓	✓			✓			✓			✓	✓	✓
Coffee	✓	✓								✓				
Cheese	✓	✓	✓	✓					✓	✓			✓	
Nuts		✓	✓	✓	✓								✓	
Pasta Dough	✓	✓	✓		✓	✓			✓	✓				✓
Breadcrumbs	✓	✓	✓		✓	✓								✓
Tea	✓	✓												
Potato/ Corn Flakes	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓
Ingredients	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
Biscuits	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
Infant Food	✓	✓	✓	✓	✓			✓		✓	✓		✓	✓

CALIBRATION TRANSFER ——— *"Plug and Play"*

The "State-Of-The-Art" diode array technology and the "Unique Zeiss Polychromator" design offers a very high degree of reliability and permanent correctness of the spectral wavelength by eliminating moving mechanical components and the powerful applications software enable the calibration transfer among the CORONA FAMILY is so simple on a ***"Plug and Play"*** basis.
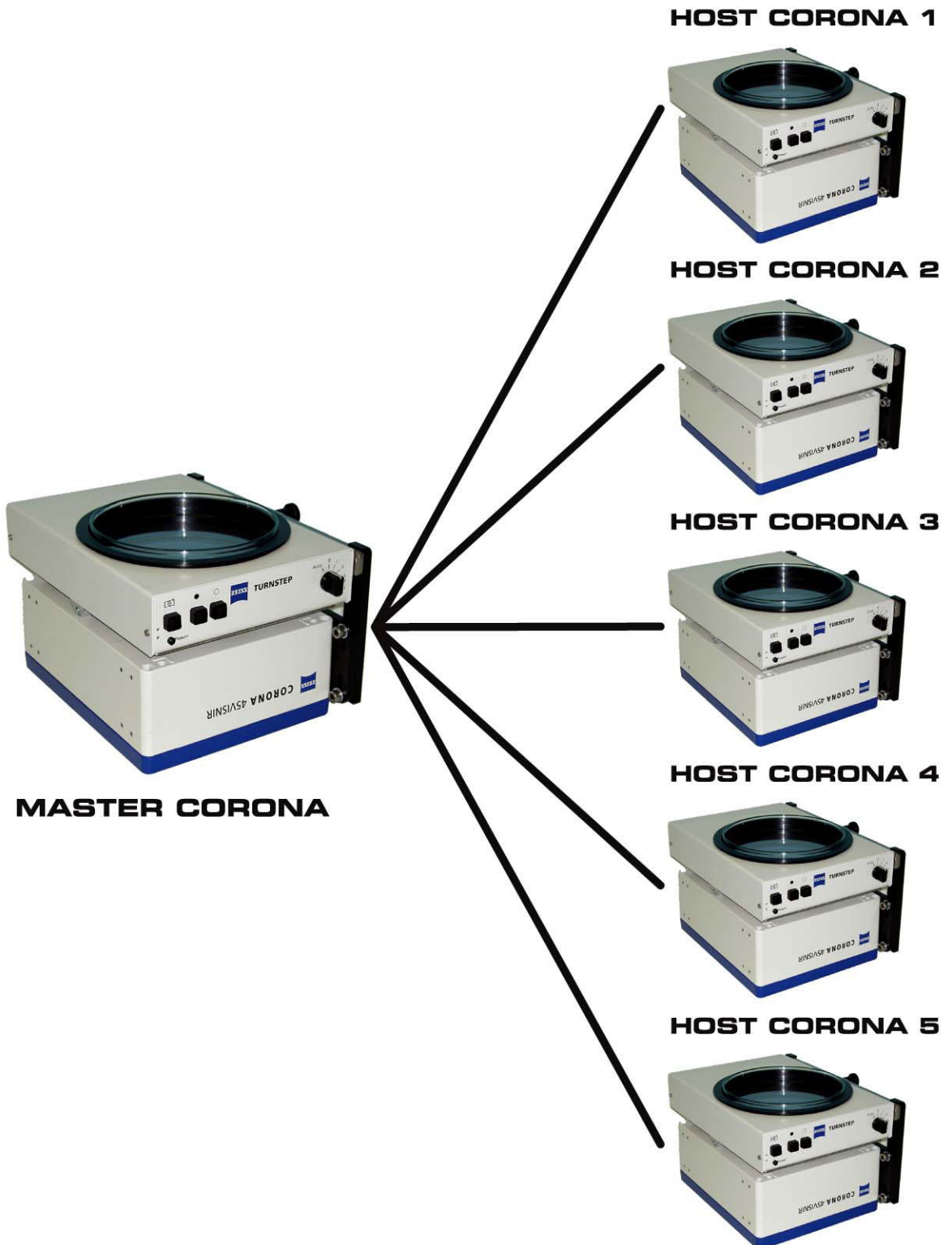
HOST CORONA 1

HOST CORONA 2

HOST CORONA 3

HOST CORONA 4

HOST CORONA 5

MASTER CORONA

CORONA - Technical Data

Mechanical Specifications	* optional item, not included in standard delivery
Range of operating temperatures	0°C .... + 40°C
Storage temperatures	- 10°C ....+ 65°C
Power consumption	< 30 VA
Power supply	12V,2.2A
Spectrometer-PC communication interface	RS 422, RS 485*, RS 232*, RS 422 - fibre link*
Spectrometer-to-PC distance	< 10 m (RS 422), < 80 m (RS 232 / RS 485) < 2000 m (RS 422 fibre link)
Digital inputs/outputs	4 inputs (0 ... 24 V external voltage) 4 outputs (0 ... 24 V external voltage)
Dimensions (W x H x D) in mm	About 324 x 168 x 246
Weight	About 7 kg
Protection grade	IP 65 (NEMA 4)
Optical Specifications	** depending on the type of CORONA
Spectrometer	Single beam diode array
Polychromator	MMS NIR 1.7
Sensor array	InGaAs array, 1-stage peltier cooling
Number of diodes	128 /256**
Wavelength range	950 ... 1700 nm
Spectral resolution	6/ 3** nm/diode (18/ 12**) nm/Rayleigh)
Wavelength accuracy	< 0.6 nm
Amplitude resolution	15 bits
Light source	Halogen lamp 5/10 V, 8/ 18 W, stabilized**
Lifetime of light source	About 3000 h
Measuring geometry	0° / 45° circular-shaped
Working distance (path height)	About 13 mm
Measuring spot	About 15 mm
Max. measuring rate	100 measurements/second (with RS 422 interface) 80 measurements / second (with RS 485 interface) 5 measurements/second (with RS 232 interface)
100% calibration	To external white standard
Sensor Specifications	
Reflectance range	0.2% ... 100% R
Reflection accuracy	< 0.2%
Reproducibility	30 measurements at two-second intervals. on white
at 0.1 s. measuring time	< 0.0003 AU ms
at 1 s. measuring time	< 0.0002 AU ms
Inter- instrument agreement	< 10 mAU differential between different sensors
Stray light	< 0.1% R (measurement with H_2O on 1.45 µm water band)
Drift	< 0.1 % R/h (after warm-up of > 30 minutes)

SCA