Pranalytica, Inc.
An ISO 9001 Certified Company

Nephrolux® Human Breath Ammonia Analyzers

Specifications

Nephrolux® is Pranalytica's ammonia sensor for noninvasive diagnostics of kidney disorder and malfunction in human patients. When an individual suffers kidney disorder, the level of urea nitrogen and creatinine in the blood of the individual rises. Traditional techniques for determining the blood urea nitrogen and creatinine involve drawing blood samples from the patients and subsequent laboratory analysis, which may take as long as 24-48 hours. Pranalytica's Nephrolux® sensor measures the concentration of ammonia in the human exhaled breath, which has been shown to have one-to-one correlation with blood urea nitrogen and creatinine concentration. The breath ammonia concentration determination takes about 2 minutes and provides the needed data without the use of invasive, expensive and non-real time blood sampling. Because of the completely non-invasive manner in which breath ammonia testing is carried out, the test could be administered to a patient to determine the blood urea nitrogen and creatinine clearance for a patient with terminal kidney failure undergoing a dialysis treatment. The test could be administered often during a dialysis session and the results obtained instantaneously for assuring adequate dialysis.

There are other potential application of the Nephrolux® is in the general area of abnormal pregnancy including preeclampsia where monitoring breath ammonia concentration may provide early warning of likely problems.

Nephrolux®	
Minimum detectivity	1 ppb (parts-per-billion)
Measurement cycle	Continuous or single shot
Measurement process	Direct measurement ammonia, no preconcentration or conversion required
Measurement time	120 seconds
Analyzer operation	Autonomous (no operator attention necessary)
Selectivity	No interference from other ammonium containing compounds, hydrocarbons, hydrogen sulfide, sulfur dioxide, water and NO_X
Linearity	±10% over the range of interest for measuring breath ammonia
Accuracy	±1 ppb or ±10% of the reading (whichever is greater)

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Precision	±1 ppb or ±10% of the reading which ever is larger (relative accuracy)
Zero drift	±1 ppb per week (non-cumulative)
Control processor	Pentium class microcomputer embedded in the Nitrolux
Operating system	LINUX based to assure high reliability
Data storage	• Embedded in the Nephrolux® • All completely solid state memory for crash-proof reliability • User data storage capacity for > 1 year (Option EDS provides over 4 years of continuous data storage capability)
Data display	• Touch screen display on the sensor showing the last measurements of ammonia, carbon dioxide, humidity and date and time. Touch screen permits continuous or single shot measurements • Optional full color graphical display showing ammonia, CO_2, and humidity as a function of time (option DS1)
Data output	• RS 232 serial data (optional) • USB key • Network connection
Gas handling	Internal vacuum pump with gas flow of ~1.6 lpm
Gas inlet temperature	0 to 40 C
Special gas needs	None
Routine calibration	Not required at the quoted sensitivity; recommended calibration every six months (using the optional calibration system CAL1)
Consumables	Fresh gas collection face mask and Breath Capacitor® needed for each new subject
Operating environment	10 to 30 C; 0-95% RH (non-condensing); requires no special cooling
Electrical	• 110-230V AC, 60 Hz • Power consumption: Sensor: <300W Display: <200W (optional)
Physical	19”W X 26” D X 8” H (rack mount configuration)
Weight	• Sensor 65 lbs • Display 22 lbs

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