Technology Guide Blood Gas Analyzers

		ALERE INC	INSTRUMENTATION LABORATORY	NOVA BIOMEDICAL
Product		epoc®	GEM® Premier™ 4000 critical care analyzer	Stat Profile® pHOx®
				
Web site		www.alere.com	www.ilus.com	www.novabiomedical.com
Calibration/Measurement	Sample volume	92 µL	65 µL micro mode, 100 µL CO-Ox/Total Bilirubin, 135 µL full menu	45 µL to 125 µL
	Calibration time	~170 seconds	Automated continuous with iQM	3 to 5 minutes
	Measurement time	~35 seconds	70 seconds for electrochemical and 25 additional seconds for CO-Ox	45 to 52 seconds
	Analytes	Measured: pH, Pco_2, Po_2, Hct, Na, K, iCa, Lactate, Glucose; Calculated: Hgb, O2SAT, BEb, BEecf, tco_2, Hco_3	Measured: pH, Pco_2, Po_2, Na^+, K^+, Cl^-, iCa^{++}, Glu, Lact, Hct, tHb, COHb, HHb, MetHb, O2Hb, Total Bilirubin; Calculated: Hct, tco_2, BEecf (in vivo), BE(B) (in vivo), tHb(c), Ca^{++} (7.4), anion gap, P/F ratio, pAo_2, Cao_2, Cvo_2, P50, O2cap, sO_2(c), Hco_3^- std, $Hco3_3^-$ (c), $AaDO_2$, Pao_2/PAo_2, RI, CcO_2, a-vDO_2, Qsp/Qt(est), Qsp/Qt	pH, Po_2, Pco_2, SO2%, Hct, Hb, Na^+, K^+, Cl, Ca, Glu, Lac
	Typical cycle time	~30 seconds	90 seconds	Throughput of 40 to 50 samples per hour
	Operating temperature	15°C to 30°C (59°F to 86°F)	12°C to 32°C (53.6°F to 89.6°F)	Ambient operating temperature is 15°C to 30°C (59°F to 86°F)
	Sample type	Heparinized or un-anticoagulated arterial, venous, or capillary whole blood	Whole blood, capillary, mixed venous, arterial, venous	Whole blood, arterial, mixed venous, venous, capillary, serum/plasma
	Measurement principle	pH, iCa, Pco_2, Na, K: potentiometry; Po_2, lactate, glucose: amperometry; Hct: conductometry	Electrochemical, conductivity, CO-Ox	Direct ISE, Severinghaus, Optical, Conductivity, Enzyme/Amperometric
	Sample application	Injection	Syringe, capillary, tube, ampoule	Syringe, tube, capillary tube (no adapter required)
	Data storage	Data Management System, Database and Web Server Security	100 MB (unlimited patient samples)	All quality control data is automatically stored. Daily and cumulative statistical reports and Levey-Jennings graphs can be printed at any time.
Security	Password	Yes	Yes	Multilevel password with unique user ID No.
	QC Lockout	Yes	User definable QC and new lot lockout options	Yes
Dimensions/ Weight	Height x width x depth (inches)	3 x 3.4 x 8.5	18 x 12 x 15	15 × 12 × 15
	Weight	~1.5 pounds	44 pounds	18 pounds
Miscellaneous	Voltage/frequency	Reader: AC input: 100-240 Vac, .5 amps, 50-60 Hz; DC output: 5 volts, 3 amps; Host: Input: 100-240 Vac, 50/60 Hz, 500 mA; Output: 5 Vdc, 3000 mA	100 VAC/3 Amps Voltage - /Freq - 50/60 Hz	90-264 VAC, 50/60 Hz
	Power consumption (max)	DC output: 5 volts, 3 amps	300 VA	200 W
	Interface	HL7	ASTM1394/HL7	RS232 serial communication and HL7 ASTM Standard data protocols, HL7 on TCP/IP, USB ports
	Approvals	FDA 501(k) clearance on epoc System and all analytes represented	CE, CSA, EMC Emissions and Immunity, European Union Directive 2002/96/EC on WEEE, CEI/IEC 61010.1, FDA	ISO 13485; 2003, ISO 9001; 2000 Quality System, Registration, CSA, TüV, IVDD CE Self Declared, CSA, TüV. Complies to EN 61010, EN 50081,82
Other Features		Room-temperature card storage (up to 6 months); bar-coded test cards for quality and inventory management; fully wireless data transfer to data manager, real time (no need to dock for download).	iQM detects, corrects, and documents instrument errors, reducing error detection time to minutes; single component, multi-use PAK includes all testing components, is changed every 30 days, requires no refrigeration or maintenance; GEMweb Plus Custom Connectivity software allows access and control from any networked PC or GEM Premier 4000 analyzer.	Onboard auto-cartridge QC; all-liquid calibration cartridge eliminates gas tanks; single reagent cartridge has all supplies for calibration and waste collection.

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		NOVA BIOMEDICAL	OPTI MEDICAL	SIEMENS HEALTHCARE DIAGNOSTICS INC
Product		Stat Profile® pHOx® ULTRA	OPTI® CCA-TS analyzer	RAPIDPoint® 500 system
				
Web site		www.novabiomedical.com	www.optimedical.com	www.siemens.com/diagnostics
Calibration/Measurement	Sample volume	60 µL to 210 µL	125 µL for most cassettes, 60 µL cassette available	Max no. of patient samples per hour/max no. measured; results per hour 25/up to 325; sample size 100 µL minimum
	Calibration time	3 to 5 minutes	~1 minute	1 and 2 point (manual and automatic); 1 point: 30 minutes; 2 point: 2 hours
	Measurement time	1 to 2 minutes	~1.5 minutes	~60 seconds to result
	Analytes	pH, Po_2, Pco_2, SO2%, Hct, Hb, Na, K, Cl, Ca, iMg, Glu, BUN, Creat, Lac, CO-Ox (HHb, O2Hb, COHb, MetHb, tBil)	pH, Pco_2, Po_2, tHb, So_2, Na^+, K^+, iCa, Cl^-, glucose, lactate, and BUN (in various test configurations)	pH, Pco_2, Po_2, Hb, Na^+, K^+, Cl^-, iCa, glucose, neonatal total bilirubin, COOXimeter fractions (fO_2Hb, fCOHb, fMetHb, fHHb)
	Typical cycle time	Throughput up to 38 samples per hour	~2.5 minutes	~60 seconds
	Operating temperature	Ambient operating temperature is 15°C to 30°C (59°F to 86°F)	10°C to 32°C (50°F to 90°F)	15°C to 32°C (59°F to 90°F)
	Sample type	Whole blood, arterial, mixed venous, venous, capillary, serum/plasma	Whole blood, serum, plasma	Whole blood
	Measurement principle	Direct ISE, Severinghaus, Amperometric, Optical, Conductivity, Enzyme/ Amperometric	Optical fluorescence and reflectance	pH, iCa, Na, Cl, K: potentiometry using ISE; Pco_2: potentiometry based on Severinghaus; Po_2: amperometric; glucose: amperometric, glucose oxidase; Hb: spectrophotometric
	Sample application	Syringe, tube, capillary tube (no adapter required)	Syringe or capillary by automatic aspiration	Specimen types suitable for device: whole blood, capillary, mixed venous, arterial, venous, heparin/aspiration
	Data storage	Onboard data management	Holds 200 patient records and 1 month of QC on board.	RAPIDComm Data Management system
Security	Password	Multilevel password with unique user ID No.	Password protected setup and operation, holds up to 300 secure operator IDs/PINs.	Yes
	QC Lockout	Yes	User definable QC and new lot lockout options	Yes
Dimensions/ Weight	Height x width x depth (inches)	17.2 × 22.4 × 17.3	5 x 14 x 9	21.5 × 11.5 × 16
	Weight	53 pounds	12 pounds with rechargeable battery	36.5 pounds
Miscellaneous	Voltage/frequency	90-264 VAC, 50/60 Hz	120 or 240 AC/50-60 Hz	n/a
	Power consumption (max)	350 W	110 VA	n/a
	Interface	RS232 serial communication and HL7 ASTM Standard data protocols, HL7 on TCP/IP, USB ports	Ethernet, serial (ASTM or ASCII)	Ethernet and RS232 via the Siemens communication protocol LIS3 and serial RS232 option
	Approvals	ISO 13485; 2003, ISO 9001; 2000 Quality System, Registration, CSA, TüV, IVDD CE Self Declared, CSA, TüV, Complies to EN 61010, EN 50081,82	CE, UL, IVDD	FDA approved
Other features		Large whole blood critical care menu (20 tests), BUN, ionized Mg available exclusively from Nova; onboard co-oximeter; onboard QC cartridge provides sufficient QC materials for 30-day auto QC analysis; allows user to program frequency and select report protocol.	Single use measurement cassette with automatic sample aspiration; color touch screen interface; barcode scanner; heated measurement for cold environments.	No maintenance, multi-use cartridge; fast time to patient results and sample to sample throughput; 28-day, onboard, automatic quality control cartridge.