

IN VITRO BLOOD GAS ANALYZERS

Part 1 of 7	Abbott Point of Care	Alere	Instrumentation Laboratory
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Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	i-STAT System/1992/— 30,000+/20,000+/\$13,924.05 9.25 x 3 x 2.85 inches/22.4 ounces	epoc Blood Analysis System/2008/— —/—/\$7,500 3 x 3.4 x 8.5 inches/~1.5 pounds	GEM Premier 5000/2015/— >200 worldwide/\$57,500 18.6 x 13.0 x 16.4 inches/45.4 pounds
Analytes measured on device	pH, pCO ₂ , pO ₂ , Hct, Na, K, Cl, iCa, lactate, glucose, creatinine, BUN, TC0 ₂ , cTnl, CK-MB, BNP, ACT, PT/INR	pH, pCO ₂ , pO ₂ , Na+, K+, Ca++, glucose, Hct, lactate, Crea, Cl-	pH, pO ₂ , pCO ₂ , Hct, Na, K, Cl, iCa, glucose, lactate, tHb, O ₂ Hb, HHb, COHb, MetHb, sO ₂ , tBili
Parameters calculated on device	Hb, Hct, O ₂ SAT, BE, TC0 ₂ , HC0 ₃	cHC0 ₃ , cTC0 ₂ , BE(ecf), BE(b), cS0 ₂ , cHgb, eGFR, eGFR-a, AGap, AGapK	TC0 ₂ , BEecf (in vivo), BE(B) (in vivo), tHb(c), Ca++ (7.4), anion gap, P/F ratio, pA0 ₂ , Ca0 ₂ , Cv0 ₂ , P50, O ₂ ct, O ₂ cap, sO ₂ (c), HC0 ₃ std, HC0 ₃ (c), A-aD0 ₂ , paO ₂ /pA0 ₂ , RI, Cc0 ₂ , a-VD0 ₂ , Qsp/Qt(est), Qsp/Qt, Hct(c), temperature corrections
Barometric pressure	measured	recorded	—
Analytical method(s) or technologies employed	electrochemical for all analytes	pH, iCa, pCO ₂ , Na, K: potentiometry; pO ₂ , lactate, glucose: amperometry; Hct: conductometric; Hb: calculated	pH, pCO ₂ : potentiometry; pO ₂ , glucose, lactate: amperometry; Hct conductivity; Hb, O ₂ Hb, COHb, MetHb, HHb, tBili: spectrophotometric; Na, Cl, iCa, K: potentiometric ion-selective electrode
Device is part of a series of related models	no	no	yes
Device warranty/Loaner devices provided	1 year replacement/—	1 year; extended warranty available/—	yes/5 years
Average life expectancy of device	8 years	—	7 years
Open or closed system/External gas tanks required	closed/no	closed/no	closed/no
Categorized for point-of-care testing or laboratory	point-of-care testing	point-of-care testing	point-of-care testing and clinical laboratory
Point of care:			
Disposable prepackaged system used for analysis	reagent, electrode (single use)	reagent, electrode (single use)	all-in-one, multiuse cartridge
No. of disposable reagent system units in standard package	25	50	1
No. of samples analyzed per one disposable reagent, electrode system	1	1	75-, 150-, 300-, 450-, and 600-test cartridge
Reagent unit storage requirements	refrigerate: 2-month shelf life for blood gas cartridges, 2-week shelf life for all others	room temperature	room temperature
Shelf life of disposable units	up to 6 months	up to 5 months	6 months
Laboratory:			
No. of different disposable reagents required to maintain device	—	—	1
Max. No. of analyte reagents that can reside in device at once	—	—	1 all-in-one, multiuse cartridge
Shelf life of components	—	—	6 months (cartridge)
Cost per test/Reagent cost per test	—	—	varies with size and menu/—
Calibrations required	1 point (automatic)	1 point (automatic)	automated continuous with Intelligent Quality Management 2 (iQM2)
Calibration frequency	every test	every test	automated continuous with iQM2
Internal QC program recommended	electronic QC, automated internal wet QC	—	internal, automated, continuous quality management included
QC features/Capabilities of QC features	comparable plot/monthly cumulative reports (available with external system)	—	onboard iQM2/automated on-demand monthly reports include number of measurements, mean, maximum, and minimum delta values
Remote control of device from laboratory	yes	yes	yes (with GEMweb Plus)
System can use LOINC to transmit results to LIS	no	yes	yes
Specimen types suitable for device	whole blood, capillary, mixed venous, arterial, venous	whole blood, capillary, mixed venous, arterial, venous	heparanized whole blood (arterial, venous, mixed venous, capillary*)
Acceptable anticoagulants/Sampling technique	heparin/injection, capillary transfer and fill	heparin/injection, capillary transfer and fill	heparin/aspiration
Sample size for complete panel of analyte results	96 µL blood gas, 65 µL electrolytes	~92 mL	150 µL, 100 µL (CO-Ox and tBili), 65 µL micro mode*
Sample size differs with number of analytes selected	no	no	no
Time from sample introduction to result availability	~2 minutes	~35 seconds	45 seconds
Max. No. of patient samples per hour/Max. No. measured results per hour	20 per unit/160	—	29/493
Optimal throughput when analyzer calibrated, awaiting specimens	—	—	29 samples per hour
Calibration can be interrupted to perform stat sample	—	no	yes
Known interferences	—	—	interferences detected by iQM2 and operator notified
Sampler has self-wiping probe	—	no	yes
Time required for maintenance by lab personnel	—	—	none (disposable cartridge)
Service center performs diagnostics through modem	yes	no	no (VPN data transfer can be configured)
Method of analyst ID in system	keypad entry/barcode scanner (customizable)	—	barcode reader or manual virtual keyboard entry
Instrument response for:			
• hardware failure/software failure	code number error message/code number error message	error code, rejection of card/error code, rejection of card	operator warning, sampling lockout if necessary/operator warning, sampling lockout if necessary
• QC failure	code number error message	failure noted on final report	iQM2 will automatically detect and perform corrective actions or disable analyte if necessary
• calibration failure	code number error message	card rejected	iQM2 will automatically detect and perform corrective actions or disable analyte if necessary
For what barcode scanning is provided	operator and patient IDs, reagent lot number	operator and patient IDs, reagent lot number, all open fields	operator and patient IDs, GSE/GHE lot number
Built-in printer/Data port	no/—	no/—	yes/4 RS-232 serial ports, 1 parallel port, 1 Ethernet port, 4 USB ports
Information listed on hard-copy report	device-unique identifier, operator and patient IDs, results, QC results, QC identifier	all	patient demographics, hospital name and address, results, result flags and legend, reference and critical ranges (optional), comments, notification information
Analyzer connections	LIS/HIS, via data-management system	LIS/HIS, via data-management system	LIS/HIS via GEMweb Plus Custom Connectivity, vendor-neutral or Web-based systems
Interface standards supported	ASTM 1394 and 1238, HL7	HL7	ASTM 1397, HL7
How analyzer connects to external system to upload patient and QC results	hospital Ethernet or wireless network	real-time wireless (RF)	direct serial, hospital network, real-time wireless
Information included in transmission from analyzer to external system	device-unique identifier, operator and patient IDs, results, QC identifier, others	device-unique identifier, operator and patient IDs, results, QC identifier, others	device identifier, operator and patient IDs, patient results, QC identifier and results
Hardware and software for data-management system	PrecisionWeb, Central Data Station	software only	GEMweb Plus
No. of different management reports system produces	35+	customizable	4 (15 additional reports with GEMweb Plus)
Contents downloaded from data-management system to analyzer	valid operator IDs, device behavior customizations	valid operator IDs, others	most configuration information, including valid operator IDs, lots, and ranges
System connected (live installations) to which LISs, HISs	major LIS vendors	most	major HIS/LIS vendors
Use a third-party interfacing tool, engine for LIS, HIS interfaces	yes, Sybase Interface Manager	yes, Mirth	MAS RALS, Telcor
Distinguishing features (supplied by company)	handheld, portable, single-use test cartridge menu; broad test menu; laboratory-accurate results at the bedside; integrated 802.11b or g bidirectional data transmission to data manager	room-temperature card storage; barcoded test cards for quality and inventory management; fully wireless data transfer to data manager, real time (no need to dock for download)	iQM2 with IntraSpect technology detects potential errors, to include transient errors before, during, and after each sample analysis, along with real-time correction and documentation; iQM2 performs five process control solutions continuously to monitor sensor performance at all pertinent medical decision levels throughout cartridge-life use; enhanced operational and workflow efficiency through 31-day all-in-one, multiuse PAK that requires no refrigeration or maintenance; software allows complete control of analyzers, operators, or data through a networked PC, mobile device, or analyzer
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>			<i>*not available in all countries</i>

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Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	GEM Premier 3000/2000/— >10,000 worldwide/\$39,995 17 x 12 x 12 inches/29.5 pounds	GEM Premier 3500/2009/— >3,000 worldwide/\$45,000 17.5 x 13 x 11.8 inches/31.2 pounds	GEM Premier 4000/2006/— >7,000 worldwide/\$50,000 18 x 12 x 15 inches/44 pounds
Analytes measured on device	pH, pO ₂ , pCO ₂ , Hct, Na, K, iCa, glucose, lactate	pH, pO ₂ , pCO ₂ , Hct, Na, K, iCa, glucose, lactate	pH, pCO ₂ , pO ₂ , Hct, Na, K, Cl, iCa, lactate, glucose, tHb(c), O ₂ Hb, COHb, MetHb, HHb, tBili
Parameters calculated on device	A-aDO ₂ , pA ₀₂ , paO ₂ /pA ₀₂ , RI, O ₂ cap*, O ₂ Ct*, CaO ₂ *, CvO ₂ *, CcO ₂ *, a-vDO ₂ *, Qsp/Qt, P ₅₀ , HCO ₃ -, BEb, BEecf, tCO ₂ c, SO ₂ c, tHbc, Ca ⁺⁺ (7.4)	A-aDO ₂ , pA ₀₂ , paO ₂ /pA ₀₂ , RI, O ₂ cap*, O ₂ Ct*, CaO ₂ *, CvO ₂ *, CcO ₂ *, a-vDO ₂ *, Qsp/Qt, P ₅₀ , HCO ₃ -, BEb, BEecf, tCO ₂ c, SO ₂ c, tHbc, Ca ⁺⁺ (7.4)	TCO ₂ , BEecf (in vivo), BE(B) (in vivo), tHb(c), Ca ⁺⁺ (7.4), anion gap, P/F ratio, pA ₀₂ , CaO ₂ , CvO ₂ , P ₅₀ , O ₂ ct, O ₂ cap, sO ₂ , sO ₂ (c), HCO ₃ -std, HCO ₃ -(c), A-aDO ₂ , paO ₂ /pA ₀₂ , RI, CcO ₂ , a-vDO ₂ , Qsp/Qt(est), Qsp/Qt, Hct(c), temperature corrections
Barometric pressure	—	—	—
Analytical method(s) or technologies employed	pH, pCO ₂ : potentiometry; pO ₂ , glucose, lactate: amperometry; Hct: conductivity; Na, K, iCa: potentiometric ion-selective electrode	pH, pCO ₂ : potentiometry; pO ₂ , glucose, lactate: amperometry; Hct: conductivity; Na, K, iCa: potentiometric ion-selective electrode	pH, pCO ₂ : potentiometry; pO ₂ , glucose, lactate: amperometry; Hct: conductivity; Hb, O ₂ Hb, COHb, MetHb, HHb, tBili: spectrophotometric; Na, Cl, iCa, K: potentiometric ion-selective electrode
Device is part of a series of related models Device warranty/Loaner devices provided Average life expectancy of device Open or closed system/External gas tanks required Categorized for point-of-care testing or laboratory	yes 5 years/yes 7–10 years closed/no point-of-care testing and laboratory	yes 5 years/yes 7–10 years closed/no point-of-care testing and laboratory	yes 5 years/yes 7 years closed/no point-of-care testing and laboratory
Point of care: Disposable prepackaged system used for analysis No. of disposable reagent system units in standard package No. of samples analyzed per one disposable reagent, electrode system Reagent unit storage requirements Shelf life of disposable units	multiuse cartridge 1 35-, 75-, 150-, 300-, 450-, and 600-test cartridge room temperature 6 months	multiuse cartridge 1 75-, 150-, 300-, 450-, and 600-test cartridge room temperature 6 months	multiuse cartridge 1 cartridges available: 75, 150, 300, 450, 600 room temperature 6 months
Laboratory: No. of different disposable reagents required to maintain device Max. No. of analyte reagents that can reside in device at once Shelf life of components Cost per test/Reagent cost per test	1 1 multiuse cartridge 6 months (cartridge) varies with size and menu/—	1 1 multiuse cartridge 6 months (cartridge) varies with size and menu/—	1 1 multiuse cartridge 6 months (cartridge) varies with size and menu/—
Calibrations required	automated continuous with Intelligent Quality Management (iQM)	automated continuous with Intelligent Quality Management (iQM)	automated continuous with Intelligent Quality Management (iQM)
Calibration frequency	automated continuous with iQM	automated continuous with iQM	automated continuous with iQM
Internal QC program recommended	internal, automated, continuous quality management included	internal, automated, continuous quality management included	internal, automated, continuous quality management included
QC features/Capabilities of QC features	onboard iQM/automated on-demand monthly reports include number of measurements, mean, maximum, and minimum delta values	onboard iQM/monthly report includes number of measurements, mean, maximum, and minimum delta values	onboard iQM/monthly report includes number of measurements, mean, maximum, and minimum delta values
Remote control of device from laboratory System can use LOINC to transmit results to LIS	no yes	no yes	yes (with GEMweb Plus) yes
Specimen types suitable for device Acceptable anticoagulants/Sampling technique Sample size for complete panel of analyte results Sample size differs with number of analytes selected Time from sample introduction to result availability	whole blood, arterial, venous, mixed venous, capillary heparin/aspiration 135 µL no 85 seconds	whole blood, arterial, venous, mixed venous, capillary heparin/aspiration 135 µL no 85 seconds	whole blood, capillary, mixed venous, arterial, venous heparin/aspiration 150 µL, 100 µL (CO-Ox and tBili), 65 µL micro mode yes 70 seconds for electrochemical; 25 additional seconds for CO-Ox 20/320 20 samples per hour yes interferences detected by iQM and operator notified yes
Max. No. of patient samples per hour/Max. No. measured results per hour Optimal throughput when analyzer calibrated, awaiting specimens Calibration can be interrupted to perform stat sample Known interferences Sampler has self-wiping probe	20/180 20 samples per hour yes interferences detected by iQM and operator notified yes	20/180 20 samples per hour yes interferences detected by iQM and operator notified yes	20/320 20 samples per hour yes interferences detected by iQM and operator notified yes
Time required for maintenance by lab personnel Service center performs diagnostics through modem Method of analyst ID in system	none (disposable cartridge) no manual or barcode entry of ID and password (customizable)	none (disposable cartridge) no manual or barcode entry of ID and password	none (disposable cartridge) no (VPN data transfer can be configured) wireless barcode gun or manual virtual keyboard entry
Instrument response for: • hardware failure/software failure • QC failure • calibration failure	operator warning, sampling lockout if required/operator warning, sampling lockout if required iQM will automatically detect and perform corrective actions or disable analyte if necessary iQM will automatically detect and perform corrective actions or disable analyte if necessary	operator warning, sampling lockout if necessary/operator warning, sampling lockout if necessary iQM will automatically detect and perform corrective actions or disable analyte if necessary iQM will automatically detect and perform corrective actions or disable analyte if necessary	operator warning, sampling lockout if necessary/operator warning, sampling lockout if necessary iQM will automatically detect and perform corrective actions or disable analyte if necessary iQM will automatically detect and perform corrective actions or disable analyte if necessary
For what barcode scanning is provided	operator and patient IDs, CVP, ContrIL values	operator and patient IDs, CVP, ContrIL values	operator and patient IDs, GSE/GHE lot number
Built-in printer/Data port	yes/3 RS-232, 1 parallel, barcode reader port, Ethernet port	yes/4 USB, 3 RS-232, 1 parallel, barcode reader port, Ethernet	yes/4 RS-232, 1 parallel port, 1 Ethernet port, 4 USB ports
Information listed on hard-copy report	patient demographics, hospital name and address, results	patient demographics, hospital name and address, results	patient demographics, hospital information, results, result flags and legend, reference and critical ranges (optional), comments, notification information
Analyzer connections	GEMweb, GEMweb Plus, Impact for Critical Care	GEMweb, GEMweb Plus, Impact for Critical Care	LIS/HIS via direct interface or GEMweb Plus Custom Connectivity; vendor-neutral or Web-based systems
Interface standards supported How analyzer connects to external system to upload patient and QC results Information included in transmission from analyzer to external system	ASTM protocol direct serial, Ethernet, modem dial-in device identifier, operator and patient IDs, patient results, QC identifier and results Impact for Critical Care customizable patient ID, demographics	ASTM and HL7 protocols direct serial, Ethernet, modem dial-in device identifier, operator and patient IDs, patient results, QC identifier and results GEMweb, GEMweb Plus, Impact for Critical Care customizable patient ID, demographics	ASTM 1394, HL7 direct serial, hospital network, real-time wireless device identifier, operator and patient IDs, patient results, QC identifier and results GEMweb Plus 4 most configuration information, including valid operator IDs, QC lots, and ranges
Hardware and software for data-management system No. of different management reports system produces Contents downloaded from data-management system to analyzer	major HIS/LIS vendors MAS RALS, Telcor	major HIS/LIS vendors MAS RALS, Telcor	major HIS/LIS vendors MAS RALS, Telcor
System connected (live installations) to which LISs, HISs Use a third-party interfacing tool, engine for LIS, HIS interfaces	major HIS/LIS vendors MAS RALS, Telcor	major HIS/LIS vendors MAS RALS, Telcor	major HIS/LIS vendors MAS RALS, Telcor
Distinguishing features (supplied by company)	iQM detects, corrects, and documents system, sensor, or sample errors, reducing error-detection time to minutes; maintenance-free single, multiuse cartridge available in customized configurations for use in any hospital location	iQM detects, corrects, and documents system, sensor, and sample errors, reducing error-detection time to minutes; maintenance-free, single, multiuse cartridge available in customizable configurations for use in any hospital location; wireless communication to LIS or HIS	iQM detects, corrects, documents system, sensor, and sample errors, reducing error-detection time to minutes; single, multiuse cartridge includes all testing components, is changed every 30 days, requires no refrigeration or maintenance; GEMweb Plus software allows access and control from any networked PC or GEM Premier 4000 analyzer; Plus technology offers wireless communication to HIS/LIS, and remote service capabilities
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>	<i>*when interfaced with GEM OPL CO-Oximeter</i>	<i>*when interfaced with GEM OPL CO-Oximeter</i>	

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Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	IRMA TRUPOINT Blood Analysis System/1994/— >6,000 worldwide/— 11.5 x 9.5 x 5 inches/5.25 pounds	EasyStat/2002/— —/>>1,000/\$12,500 12.5 x 14.5 x 7 inches/16 pounds	EasyBloodGas/2000/— —/>>1,000/\$10,750 12.5 x 14.5 x 7 inches/16 pounds
Analytes measured on device	pH, pCO ₂ , pO ₂ , Hct, Na, K, Cl, iCa, glucose, BUN, creatinine, lactate	pH, pCO ₂ , pO ₂ , Hct, Na, K, Cl, iCa	pH, pCO ₂ , pO ₂
Parameters calculated on device	tHb, O ₂ SAT, BEb, BEecf, TC0 ₂ , HCO ₃ ⁻ , iCa(n), creatinine MDRD GFR	Hb, O ₂ SAT, BE, TC0 ₂ , HCO ₃	O ₂ SAT, BE, TC0 ₂ , HCO ₃
Barometric pressure	measured	recorded, measured	measured
Analytical method(s) or technologies employed	pH, pCO ₂ , Na, Cl, iCa, K, BUN, creatinine, lactate (enzymatic); potentiometric; pO ₂ , glucose (enzymatic); amperometric; Hct: conductometric	pH, iCa, pCO ₂ , pO ₂ , Na, Cl, K: ISE-potentiometry; Hct: conductivity; Hb: calculated from Hct	pCO ₂ , pH: ISE-potentiometry; pO ₂ : ISE-amperometry
Device is part of a series of related models	no	yes (expanded parameter menu; related to EasyBloodGas)	yes (basic model is first generation related to expanded model EasyStat)
Device warranty/Loaner devices provided Average life expectancy of device Open or closed system/External gas tanks required Categorized for point-of-care testing or laboratory	2 years/yes 7 years closed/no point-of-care testing	1 year/yes 7–10 years closed/no laboratory	1 year/yes 7–10 years closed/no laboratory
Point of care: Disposable prepackaged system used for analysis No. of disposable reagent system units in standard package No. of samples analyzed per one disposable reagent, electrode system Reagent unit storage requirements Shelf life of disposable units	reagent, electrode (single use) 25 1 room temperature; creatinine 2°–8°C up to 6 months	reagent, electrode 1 based on testing volume per day room temperature reagents: 12 months; electrodes: 12 months	reagent, electrode 1 based on testing volume per day room temperature reagents: 12 months; electrodes: 12 months
Laboratory: No. of different disposable reagents required to maintain device Max. No. of analyte reagents that can reside in device at once Shelf life of components Cost per test/Reagent cost per test	— — — —	1 1 reagents: 12 months; electrodes: 12 months <\$0.13 at 20 samples per day/\$0.06 at 20 samples per day	1 1 reagents: 12 months; electrodes: 12 months <\$0.30 at 20 samples per day/\$0.17 at 20 samples per day
Calibrations required Calibration frequency	2 point (automatic) automatic with each sample	1 and 2 point (manual and automatic) 1 point (with every sample analysis); 2 point (can be set for 2-, 4-, or 8-hour increments)	1 and 2 point (manual and automatic) 1 point (with every sample analysis); 2 point (can be set for 2-, 4-, or 8-hour increments)
Internal QC program recommended	automatic electronic QC per shift	3 controls, 1 level per 8 hours, CLIA recommendations, Medica controls recommended	3 controls, 1 level per 8 hours, CLIA recommendations, Medica controls recommended
QC features/Capabilities of QC features	L-J plots/statistical calculations, monthly cumulative reports (idms)	L-J plots/statistical calculations, monthly cumulative reports	L-J plots/statistical calculations, monthly cumulative reports
Remote control of device from laboratory System can use LOINC to transmit results to LIS	yes no	no no	no no
Specimen types suitable for device	whole blood, capillary, mixed venous, arterial, venous	plasma, serum, whole blood, capillary, mixed venous, arterial, venous	whole blood, capillary, mixed venous, arterial, venous
Acceptable anticoagulants/Sampling technique Sample size for complete panel of analyte results Sample size differs with number of analytes selected Time from sample introduction to result availability	heparin/injection 125 µL capillary, 200 µL syringe no 60–90 seconds, on average	heparin/aspiration 100 µL, 95 µL capillary no <120 seconds (includes 1-point calibration)	heparin/aspiration 100 µL, 75 µL capillary no <125 seconds (includes 1-point calibration)
Max. No. of patient samples per hour/Max. No. measured results per hour Optimal throughput when analyzer calibrated, awaiting specimens Calibration can be interrupted to perform stat sample Known interferences Sampler has self-wiping probe	25/175 20 samples per hour — see labeling no (not needed)	30/210 30 tests per hour yes incorrect anticoagulant yes	28/84 28 tests per hour yes incorrect anticoagulant yes
Time required for maintenance by lab personnel	none	daily: 0.5 minutes; weekly: 3.5 minutes; monthly: 15 minutes	daily: 0.5 minutes; weekly: 3.5 minutes; monthly: 15 minutes
Service center performs diagnostics through modem Method of analyst ID in system	no LCD touchscreen, numeric (customizable), barcode scanner (optional)	no manual or barcode wand for ID entry (optional)	no manual or barcode wand for ID entry (optional)
Instrument response for: • hardware failure/software failure • QC failure • calibration failure	EQC failure or screen prompt/screen prompt if QC required, no access to patient testing mode test ends (no injection of sample allowed)	operator warning, error messages/error messages, user ID: sampling lockout flagged results error messages, second attempt for 2-point calibration automatically	operator warning, error messages/error messages, user ID: sampling lockout flagged results error messages, second attempt for 2-point calibration automatically
For what barcode scanning is provided	operator and patient IDs, cartridge information, lot number, quality control ranges	operator identifier, patient identifier, QC control, reagent pack automatically read when reagent module installed	operator identifier, patient identifier, QC control, reagent pack automatically read when reagent module installed
Built-in printer/Data port Information listed on hard-copy report	yes/RS-232, Ethernet LAN analyzer serial number, date, calibration successful, calibration code, lot number, patient ID and temperature, results, barometric pressure, SW version optional: user ID, reference ranges, O ₂ therapy, sample information	yes/RS-232 patient information, measured and calculated parameters, date, operator ID	yes/RS-232 patient information, measured and calculated parameters
Analyzer connections	data-management systems connect to LIS/HIS; directly to LIS/HIS (both options)	data-management system, which connects to LIS/HIS; directly to LIS/HIS	data-management system, which connects to LIS/HIS; directly to LIS/HIS
Interface standards supported How analyzer connects to external system to upload patient and QC results Information included in transmission from analyzer to external system	IRMA, ASTM 1394 hospital network, direct serial, LAN device-unique identifier, operator and patient IDs, results, QC identifier, patient O ₂ therapy information connects to Alere (MAS RALS+ and LDS Aegis POC) and Telcor data-management systems	Medica protocol direct serial operator ID, patient ID, results	Medica protocol direct serial patient ID, results
Hardware and software for data-management system	internal	internal	internal
No. of different management reports system produces Contents downloaded from data-management system to analyzer System connected (live installations) to which LISs, HISs Use a third-party interfacing tool, engine for LIS, HIS interfaces	19 all analyzer settings, software upgrades major HIS/LIS vendors yes	QC, L-J charts, patient reports — — no	QC, L-J charts, patient reports — — no
Distinguishing features (supplied by company)	self-contained and easy to use; contains onboard printer, interactive touchscreen, barcode scanning, automatic electronic QC, and site-specific custom correlation reference ranges; complete data management from patient information to lot traceability; self-calibrating cartridges with Luer lockport, which forms a closed system and reduces biohazards; room-temperature-stored cartridges	modular components; simple operation and maintenance; low operation cost; disposable, maintenance-free sensors; no gas tanks; easy inside and out	modular components; simple operation and maintenance; low operation cost; disposable, maintenance-free sensors; no gas tanks; easy inside and out

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See captodayonline.com/productguides for an interactive version of guide			
Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	Stat Profile Prime ABG/2014/— — 15.4 x 12.0 x 14.4 inches/17.9 pounds	Stat Profile Prime CCS Comprehensive/2014/— — 15.4 x 12.0 x 14.4 inches/17.9 pounds	Stat Profile pH0x Ultra/2011/— — 17.2 x 22.3 x 18.7 inches/61 pounds
Analytes measured on device	pH, pCO ₂ , pO ₂	pH, PCO ₂ , PO ₂ , Hct, Na, K, Cl, iCa, lactate, glucose	pH, PCO ₂ , PO ₂ , Hct, Hb, Na, K, Cl, iCa, iMg, lactate, glucose, creatinine, BUN, SO ₂ %, bilirubin, CO-oximetry
Parameters calculated on device	O ₂ SAT, BE, TCO ₂ , HCO ₃	Hb, O ₂ SAT, BE, TCO ₂ , HCO ₃ , Be-efc, Be-b, SBC, O ₂ Ct, O ₂ Cap, A, AaDO ₂ , a/A, RI, PO ₂ /FIO ₂ , anion gap, P50	BE, TCO ₂ , HCO ₃ -
Barometric pressure	measured	measured	tracked
Analytical method(s) or technologies employed	—	—	pH, iCa, iMg, Na, Cl, and K: direct ISE; PCO ₂ : Severinghaus; PO ₂ : amperometry; Hct: conductivity; Hb, SO ₂ %, optical-reflectance; lactate, glucose, and creatinine: enzyme/amperometric
Device is part of a series of related models	yes (Stat Profile Prime CCS has the same menu plus Hct, Na, K, Cl, iCa, glucose, lactate)	yes (has same menu minus glucose and lactate)	yes (pH0x analyzer series, pH0x Ultra without CO-ox)
Device warranty/Loaner devices provided	1 year/yes	1 year/yes	1 year/yes
Average life expectancy of device	5–7 years	5–7 years	5–7 years
Open or closed system/External gas tanks required	closed/no	closed/no	closed/no
Categorized for point-of-care testing or laboratory	point-of-care testing and laboratory	point-of-care testing and laboratory	point-of-care testing and laboratory
Point of care: Disposable prepackaged system used for analysis No. of disposable reagent system units in standard package No. of samples analyzed per one disposable reagent, electrode system Reagent unit storage requirements Shelf life of disposable units	reagent, electrode (multiuse cartridge, MicroSensor Card) 1 varies none reagents: 12 months at room temperature	reagent, electrode (multiuse cartridge, MicroSensor Card) 1 — — reagents: 12 months at room temperature	reagent 200–500 — — reagents: 18 months at room temperature; electrodes: up to 18 months
Laboratory: No. of different disposable reagents required to maintain device Max. No. of analyte reagents that can reside in device at once Shelf life of components	1 1 reagents: 12 months; MicroSensor Card: 12 months	1 1 reagents: 12 months; MicroSensor Card: 12 months	1 20 reagents and electrodes: 18 months; membrane kits: 12–24 months depends on volume/—
Cost per test/Reagent cost per test	depends on volume/—	depends on volume/—	depends on volume/—
Calibrations required	1 and 2 point (automatic)	1 and 2 point (automatic)	1 and 2 point (automatic)
Calibration frequency	1 point (variable); 2 point (variable)	1 point: variable; 2 point: variable	1 point: 30 or 45 minutes or with every sample (user selectable); 2 point: 2, 3, 4, 5, or 6 hours (user defined)
Internal QC program recommended QC features/Capabilities of QC features	minimum CLIA recommendations L-J plots, comparable plot/statistical calculations, monthly cumulative reports, true liquid quality control	minimum CLIA recommendations L-J plots/statistical calculations, monthly cumulative reports, true liquid quality control	minimum CLIA recommendations L-J plots/statistical calculations, monthly cumulative reports, true liquid quality control
Remote control of device from laboratory System can use LOINC to transmit results to LIS	no yes	no yes	yes yes
Specimen types suitable for device Acceptable anticoagulants/Sampling technique Sample size for complete panel of analyte results Sample size differs with number of analytes selected	whole blood, capillary, mixed venous, arterial, venous heparin/aspiration, capillary transfer and fill 50 µL no	whole blood, capillary, mixed venous, arterial, venous heparin/aspiration and capillary 100 µL no	whole blood, capillary, mixed venous, arterial, venous heparin/aspiration and capillary 210 µL yes, variety of micropanel options offered and can be customized from 60 to 210 µL
Time from sample introduction to result availability Max. No. of patient samples per hour/Max. No. measured results per hour Optimal throughput when analyzer calibrated, awaiting specimens Calibration can be interrupted to perform stat sample Known interferences Sampler has self-wiping probe	60 seconds 45/135 135 tests per hour yes — yes	60 seconds 45/450 45 per hour yes — yes	up to 134 seconds 26/520 23 per hour yes none yes
Time required for maintenance by lab personnel Service center performs diagnostics through modem Method of analyst ID in system	monthly: <5 minutes no multilevel password with unique user ID number (customizable)	monthly: <5 minutes no multilevel password with unique user ID number (customizable)	weekly: <5 minutes; monthly: <10 minutes yes multilevel password with unique user ID number (customizable)
Instrument response for: • hardware failure/software failure • QC failure • calibration failure	self-diagnosis software informs and notifies operator of hardware and software failures options range from flagging to not reporting test to lockout for QC failure or exceeding scheduled QC interval any test that does not calibrate will not report results	self-diagnosis software informs and notifies operator of hardware and software failures options range from flagging to not reporting test to lockout for QC failure or exceeding scheduled QC interval any test that does not calibrate will not report results	self-diagnosis software informs and notifies operator, hotline, and field support of hardware and software failures options range from flagging to not reporting test to lockout for QC failure or exceeding scheduled QC interval any test that does not calibrate will not report results and instrument notifies operator of reason for failure
For what barcode scanning is provided	operator identifier, patient identifier, reagent information is automatically captured when installed	operator and patient identifiers, reagent information is automatically captured when installed	operator and patient identifiers
Built-in printer/Data port Information listed on hard-copy report	yes/RS-232, Ethernet patient ID with accession numbers, entered settings, measured and calculated results	yes/RS-232, Ethernet patient ID with accession numbers, entered settings, measured and calculated results	yes/RS-232, Ethernet, others patient ID with accession numbers, entered settings, measured and calculated results
Analyzer connections	data-management system, which connects to LIS/HIS	data-management system, which connects to LIS/HIS	data-management system or directly to LIS/HIS, or both
Interface standards supported How analyzer connects to external system to upload patient and QC results Information included in transmission from analyzer to external system	ASTM 1394, HL7 hospital network device-unique identifier, operator and patient IDs, results, QC identifier	ASTM 1394, HL7 hospital network device-unique identifier, operator and patient IDs, results, QC identifier	ASTM 1394 and 1238, HL7, POCT1-A hospital network device-unique identifier, operator and patient IDs, results, QC identifier
Hardware and software for data-management system	—	—	full-featured onboard DMS capability, external DMS also available
No. of different management reports system produces Contents downloaded from data-management system to analyzer System connected (live installations) to which LISs, HISs Use a third-party interfacing tool, engine for LIS, HIS interfaces	>30 patient names, passwords most commercially available LIS/HIS yes, most commercially available interfaces	>30 patient names, passwords most commercially available LIS/HIS yes, most commercially available interfaces	>30 valid control values and operator IDs, patient demographics — yes
Distinguishing features (supplied by company)	Zero Maintenance MicroSensor Cartridge technology uses proven Nova measurement technology in a miniaturized sensor card format; unique Clot Block flow path is designed to eliminate downtime associated with the introduction of a clotted sample; individual cartridges for sensors, calibrators, and liquid QC optimizes the life of each element compared to a combined calibrator/sensor cartridge design	Zero Maintenance MicroSensor Cartridge technology uses proven Nova measurement technology in a miniaturized sensor card format; unique Clot Block flow path is designed to eliminate downtime associated with introduction of a clotted sample; individual cartridges for sensors, calibrators, and liquid QC optimizes the life of each element compared to a combined calibrator/sensor cartridge design	20-test whole blood critical care menu and proven platform of hybrid component cartridge-based biosensor technology; BUN, iMg available exclusively; analyzer networking at no extra cost; multiple pH0x Ultra analyzers can be networked together into a single, common database; a supervisor or authorized operator can access all patient results, QC results, and reports from all analyzers
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>			

IN VITRO BLOOD GAS ANALYZERS

Part 5 of 7	OPTI Medical Systems Dustin Moore dustin.moore@optimedical.com 235 Hembree Park Drive, Roswell, GA 30076 800-490-6784 www.optimedical.com	OPTI Medical Systems Dustin Moore dustin.moore@optimedical.com 235 Hembree Park Drive, Roswell, GA 30076 800-490-6784 www.optimedical.com	Radiometer America Telesales Department info@radiometeramerica.com 250 S. Kraemer Blvd., Brea, CA 92821 800-736-0600 www.radiometeramerica.com
See captodayonline.com/productguides for an interactive version of guide			
Name of device/First year sold/Number of analyzers sold in 2016	OPTI CCA-TS2/2013/—	OPTI CCA-TS Blood Gas Analyzer/2003/—	ABL90 FLEX/2010 in U.S./— *ABL90 FLEX PLUS/2017 in U.S./—
Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	— 5 × 14 × 9 inches/10 lbs with battery (4.3 kg) pack	— 4.7 × 14.2 × 9 inches/12 pounds (10 lbs without battery)	— 17.7 × 9.8 × 11.4 inches/24 pounds
Analytes measured on device	pH, pCO ₂ , pO ₂ , Hb, SO ₂ , Na, K, Cl, iCa, lactate, glucose, BUN	pH, pCO ₂ , pO ₂ , Na, K, Cl, iCa, tHb, SO ₂ , glucose, BUN, lactate	pH, pCO ₂ , pO ₂ , Hb, Na, K, Cl, iCa, lactate, glucose, sO ₂ , tHb, F02Hb, FCOHb, FMeHb, FHHb, FHbF, nBil
Parameters calculated on device	Hct, BE, TC02, HCO ₃ , CH+, st.pH, st.HCO ₃ -, BE(ecf), BE(act), BB, SO ₂ (c), ctO ₂ , P50, AaDO ₂ , AG, nCa++ measured	Hct, HCO ₃ , BE, BEecf, BEact, BB, tCO ₂ , pH, O ₂ ct, cH+, AaDO ₂ , AG, p50, nCa++, st.pH, st.HCO ₃ -, SO ₂ (c) measured	Hct, BE, TC02, HCO ₃ , plus 44 additional parameters
Barometric pressure	—	—	recorded, measured
Analytical method(s) or technologies employed	pH, iCa, pCO ₂ , pO ₂ , lactate, glucose, Hb, Na, BUN, Cl, K: optical fluorescence; Hct: calculated from measured Hb	optical fluorescence and reflectance	pH, iCa, pCO ₂ , lactate, glucose, Na, Cl, K: thick film sensors, potentiometric analysis; pO ₂ : optical phosphorescence; Hct: calculation; Hb: multiwavelength CO-ox spectrophotometric analysis
Device is part of a series of related models	yes (latest in OPTI CCA line)	yes (OPTI series)	no
Device warranty/Loaner devices provided	1 year full coverage/yes	1 year (service contract available for subsequent years)/yes	1 year, parts, labor, and travel (service plans available after year 1)/yes
Average life expectancy of device	10+ years	>7 years	10+ years
Open or closed system/External gas tanks required	closed/no	closed/no	closed/no
Categorized for point-of-care testing or laboratory	point-of-care testing	point-of-care testing and laboratory	point-of-care testing and laboratory
Point of care:			
Disposable prepackaged system used for analysis	single use optical sensor cassette	single-use cassettes	electrode sensors (multiuse cartridge)
No. of disposable reagent system units in standard package	25	25	1
No. of samples analyzed per one disposable reagent, electrode system	1	1	100, 300, 600, 900, 1,200
Reagent unit storage requirements	room temperature for most types	room temperature	room temperature, small SC is refrigerated
Shelf life of disposable units	6–12 months depending on type	cassette: 6–12 months depending on type	reagent/electrode system: 4 months
Laboratory:			
No. of different disposable reagents required to maintain device	1	1	2
Max. No. of analyte reagents that can reside in device at once	8	8	2 (100, 300, 600, 900, 1,200 tests)
Shelf life of components	cassette: 6–12 months depending on type	cassette: 6–8 months depending on type	reagent and sensor cartridge: 3–4 months
Cost per test/Reagent cost per test	depends on volume/depends on volume	depends on volume/depends on volume	depends on configuration/depends on volume
Calibrations required	1 point (automatic)	1 point (automatic)	1 and 2 point (automatic plus optional manual)
Calibration frequency	with each cassette	with each cassette	1 point with each sample analysis; 2 point: 8 hours (user configurable)
Internal QC program recommended	configurable according to QC regulations	minimum CLIA recommendations; electronic QC can be used for daily QC requirements	NIST-traceable QC automatic 8 hours according to CAP, CLIA, JCAHO guidelines; user configurable for increased QC frequency
QC features/Capabilities of QC features	—/statistical calculations	—/electronic QC, statistics reports	L-J plots/auto QC (statistical calculations, monthly cumulative reports, onboard and through DMS); QA management for auto troubleshooting and correction
Remote control of device from laboratory	no	no	yes
System can use LOINC to transmit results to LIS	no	yes	yes
Specimen types suitable for device	plasma, serum, whole blood, capillary, mixed venous, arterial, venous	plasma, serum, whole blood	whole blood, capillary, mixed venous, arterial, venous
Acceptable anticoagulants/Sampling technique	heparin/aspiration	heparin/aspiration and capillary	heparin, electrolyte-balanced heparin/aspiration, auto aspiration, capillary, test tube, microsample
Sample size for complete panel of analyte results	125 µL	125 µL	65 µL
Sample size differs with number of analytes selected	yes	yes, standard 3-test micropanel required is 60 µL	no
Time from sample introduction to result availability	~1 minute from sample aspiration	~1 minute from sample aspiration	35 seconds
Max. No. of patient samples per hour/Max. No. measured results per hour	25/200	24/192	50/800
Optimal throughput when analyzer calibrated, awaiting specimens	—	24 tests per hour	800 tests (equals 50 patient samples)
Calibration can be interrupted to perform stat sample	no	no	yes
Known interferences	—	—	—
Sampler has self-wiping probe	no (single use)	no (single use)	yes
Time required for maintenance by lab personnel	weekly: 1 minute; quarterly: 5 minutes; annually: 5 minutes	weekly: 1 minute; quarterly: 5 minutes; annually: 5 minutes	monthly: 1 minute as needed
Service center performs diagnostics through modem	no	no	option
Method of analyst ID in system	barcode, secure operator ID and/or password (customizable)	barcode or secure PIN for 300 operators	customizable user log-ons, barcode, onboard keyboard; built-in barcode scanner for 1,000 operators
Instrument response for:			
• hardware failure/software failure	self-diagnostic tests inform operator through screen message and sounds/screen message and sounds	error message/error message	HW/SW: system message; traffic light; audible, visual signals, parameter bar traffic light; self-correcting QA system
• QC failure	screen message (QC lockout available)	QC lockout	QC lockout and hardware-software codes same as hardware-software failure codes
• calibration failure	screen message and sounds prior to sample introduction	error message	operator and patient IDs; uses smart chips for reagents, no scanning needed
For what barcode scanning is provided	operator and patient IDs, reagent lot number	operator and patient IDs, reagent, QC	yes/RS-232, parallel, Ethernet, USB
Built-in printer/Data port	yes/parallel, Ethernet, other	yes/RS-232, Ethernet	patient information and demographics, patient therapy settings, measured and calculated results, system messages, reference and critical values, analyzer setup and configuration, and more
Information listed on hard-copy report	patient ID, demographics and results; entered settings, operator ID, calculated results, reference and critical ranges, messages	patient ID, results, patient demographics (customized), critical ranges	
Analyzer connections	data-management system connects to LIS/HIS or directly to LIS/HIS	data-management system connects to LIS/HIS or directly to LIS/HIS	directly to LIS/HIS/CIS via data-management system
Interface standards supported	ASTM, ASCII, POCT1-A	ASTM, ASCII	ASTM 1394, HL7, serial, POCT1-A, network, TCP/IP
How analyzer connects to external system to upload patient and QC results	direct serial, Ethernet hospital network	direct serial, Ethernet hospital network	hospital network (wireless and Ethernet), direct serial
Information included in transmission from analyzer to external system	device-unique identifier, operator and patient IDs, results, QC identifier	device-unique identifier, operator and patient IDs, results, QC identifier, all information pertinent to patient and QC data	device-unique identifier, operator and patient IDs, results, QC identifier, calibration and analyzer status
Hardware and software for data-management system	—	—	internal system and external: Radiance and all other DMS systems
No. of different management reports system produces	—	—	standard and user-definable reports
Contents downloaded from data-management system to analyzer	—	—	valid operator IDs
System connected (live installations) to which LISs, HISs	Meditech, McKesson, Cerner, others	Meditech, McKesson, Cerner, others	Cerner, McKesson, Meditech, Sunquest, many others
Use a third-party interfacing tool, engine for LIS, HIS interfaces	Telcor, Conworx, others	Telcor, Conworx, others	an interfacing tool or engine could be used if customer requires it
Distinguishing features (supplied by company)	accurately measures tHb and SO ₂ using optical technology in a single-use cartridge system with automated sample aspiration; easy-to-use color touchscreen guides user through testing; fast results and a new multilevel SRC that lets you run 3 levels of electronic QC at once	stable optical fluorescence technology, easy-to-use touchscreen, measured tHb and SO ₂ , no standby costs (single-use system), low maintenance	fast results: 35 sec. on 65 µL sample with 44–55/hr throughput; walk-up ready; one-handed operation with integrated user guides and low user maintenance; automatic quality management supports regulatory compliance requirements, performs continuous checks, corrective actions performed automatically <i>*features a new software platform and more parameters coming soon</i>
Note: a dash in lieu of an answer means company did not answer question or question is not applicable			

IN VITRO BLOOD GAS ANALYZERS

Part 6 of 7	Radiometer America Telesales Department 250 S. Kraemer Blvd., Brea, CA 92821 800-736-0600 www.radiometeramerica.com	Radiometer America Telesales Department 250 S. Kraemer Blvd., Brea, CA 92821 800-736-0600 www.radiometeramerica.com	Roche Diagnostics Lisa Sobek 9115 Hague Rd., Indianapolis, IN 46256 317-521-7509 www.usdiagnostics.roche.com
See captodayonline.com/productguides for an interactive version of guide			
Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	ABL 800 Series/2004/— —/—/depends on configuration 22 x 28 x 21 inches/70 pounds	ABL80 FLEX Series/2006/— —/—/depends on configuration 16 x 9 x 11 inches/19 pounds	cobas b 221 system/2004/— — 23 x 20 x 23.6 inches/99 pounds (without solutions and AutoQC)
Analytes measured on device Parameters calculated on device	pH, pCO ₂ , pO ₂ , Hb, Na, K, Cl, iCa, lactate, glucose, bilirubin, fetal Hb, O ₂ Hb, MetHb, RHb, COHb, O ₂ SAT, creatinine Hct, BE, TC0 ₂ , HCO ₃ ⁻ , plus 40 additional parameters	pH, pCO ₂ , pO ₂ , Hct, Na, K, iCa, Cl, glu, Hb, S0 ₂ , O ₂ Hb, COHb, MetHb, HHb Hb, O ₂ SAT, TC0 ₂ , HCO ₃ ⁻ , ctO ₂ (a-v), ctO ₂ , anion gap (K+), cCa ₂ ⁺ (7.40), cBase (B), ABE, SBE, others recorded, measured	pH, pCO ₂ , pO ₂ , Hct, Hb, Na, K, Cl, iCa, lactate, glucose, BUN, bilirubin, pH pleural fluid Hb, Hct, O ₂ SAT, BE, TC0 ₂ , HCO ₃ ⁻
Barometric pressure Analytical method(s) or technologies employed	measured pH: pH-sensitive glass (ISE); pCO ₂ , pO ₂ , Na, Cl, iCa, K, ISE; Hct: calculated from measuring Hb, bilirubin; Hb: optical, multiwavelength analysis, intra-cuvette ultrasonic hemolysis, and more	recorded, measured pH, pCO ₂ , pO ₂ , Na, K, iCa, Cl, glucose: thick film; amperometric/potentiometric technology; HCT: conductivity, hemoglobins, CO-oximetry	recorded, measured pH: electrode ion-selective galvanometric; pCO ₂ , pO ₂ : electrode ion-selective membrane; Hct: conductivity; Hb: CO-ox spectrophotometry; Na, Cl, iCa, K: ion-selective potentiometry; lactate, glucose, BUN: MSS sensor enzyme
Device is part of a series of related models Device warranty/Loaner devices provided	yes (ABL 800 series) 2 years, parts, labor, and travel/yes	yes 1 year, parts, labor, and travel (service plans available after year 1)/yes analyzer: 10+ years closed/no point-of-care testing and laboratory	yes (3 models in series) 1 year, parts and services/no
Average life expectancy of device Open or closed system/External gas tanks required Categorized for point-of-care testing or laboratory	20 years, with full support closed/yes (low-pressure, premixed) point-of-care testing and laboratory	analyzer: 10+ years closed/no point-of-care testing and laboratory	7 years closed/no point-of-care testing and laboratory
Point of care: Disposable prepackaged system used for analysis No. of disposable reagent system units in standard package No. of samples analyzed per one disposable reagent, electrode system Reagent unit storage requirements Shelf life of disposable units	— — — — —	electrode sensors (multiuse cartridge) 1 25, 50, 100, 200, 300 room temperature reagent and sensor cassette: 3–4 months	reagent, electrode — — room temperature reagents: 12 months; electrodes: 18 months
Laboratory: No. of different disposable reagents required to maintain device Max. No. of analyte reagents that can reside in device at once Shelf life of components Cost per test/Reagent cost per test	4 4 reagent, electrode, membrane kit, cartridge: 2+ years depends on sample volume and any extra included items/ same	2 1 sensor cassette 3–6 months depends on configuration/depends on configuration	depends on model, contact Roche 3 reagent: 1 year; electrode: 18 months onboard volume dependent/volume dependent
Calibrations required Calibration frequency	1 and 2 point (automatic) 1 point: 30 minutes BG/pH, 4 hours—manufacturer; 2 point: every 8 hours	1 and 2 point (automatic and optional manual) 1 point: with each test; 2 point: 8 hours (user definable)	1 and 2 point (automatic) 1 point: 30 minutes; 2 point: 8 hours
Internal QC program recommended	depends on hospital management and inspection agency	NIST-traceable QC material run automatically according to CLIA, CAP, JCAHO	CAP and JCAHO guidelines
QC features/Capabilities of QC features	L-J plots/comparable plot (via DMS), statistical calcs., automatic QC, monthly cumulative reports (onboard and available with external system)	L-J plots/statistical calculations, monthly cumulative (onboard—current mean, STD, CV%) reports (onboard and available with external system, PC download to Excel, QA system)	L-J plots/comparable plot, lot-to-lot comparisons, statistical calculations, monthly cumulative reports, onboard, eQAP
Remote control of device from laboratory System can use LOINC to transmit results to LIS	yes yes	yes yes	yes yes
Specimen types suitable for device Acceptable anticoagulants/Sampling technique Sample size for complete panel of analyte results Sample size differs with number of analytes selected	whole blood, capillary, mixed venous, arterial, venous, expired air heparin, electrolyte-balanced heparin/autoaspiration, syringe, capillary tube, test tube 95 µL for 17 measured parameters yes, with fewer measured parameters, smaller micro-modes available from 35 µL	whole blood, capillary, mixed venous, arterial, venous heparinized, electrolyte-balanced heparin/aspiration, capillary 70–105 µL no	plasma, serum, whole blood, capillary, arterial, venous EDTA, heparin, citrate/aspiration, injection, capillary transfer and fill, microsamples 200 µL for full panel yes, BG: 40 µL; ISE: 40 µL; CO-ox: 44 µL; glucose, lactate, BUN: 75 µL
Time from sample introduction to result availability Max. No. of patient samples per hour/Max. No. measured results per hour Optimal throughput when analyzer calibrated, awaiting specimens Calibration can be interrupted to perform stat sample Known interferences Sampler has self-wiping probe	~1 minute (depends on tests ordered) 25/425 25 tests per hour yes halothane, thiocyanic, and glycolic acids yes	70 seconds 30/270 30 patient samples per hour yes — yes	~1 minute (test dependent) 30/360 30 patient samples per hour (full panel) yes — yes
Time required for maintenance by lab personnel Service center performs diagnostics through modem Method of analyst ID in system Instrument response for: • hardware failure/software failure • QC failure • calibration failure For what barcode scanning is provided	monthly: as needed; annually: dependent on version yes customizable onboard keyboard, barcode HW/SW: system message with customized (traffic light) visual and audible signals, parameter status bar — operator and patient IDs, reagent and QC lot numbers, expiration, software keys yes/RS-232, Ethernet, USB	monthly: as needed option customizable, onboard keyboard, built-in barcode reader HW/SW: system message with customized (traffic light) visual and audible signals, parameter status bar self-correcting QA system onscreen report: same as hardware-software failure operator and patient IDs, reagent and QC lot numbers, expiration, software keys yes/RS-232, Ethernet, USB	daily: 2 minutes; monthly: 5 minutes; quarterly: 5 minutes yes 32-level password system (customizable) identified onscreen and with diagnostic routine/onscreen with messages onscreen report with high-low flagging, lockout capabilities onscreen reporting with lockout capabilities operator and patient IDs, reagent lot number, RF with transponders, expiration yes/RS-232, parallel, Ethernet options can be customized; direct and measured parameters
Built-in printer/Data port Information listed on hard-copy report	yes/RS-232, Ethernet, USB patient information and demographics, patient therapy settings, measures and calculates results, system messages, reference and critical ranges	yes/RS-232, Ethernet, USB patient information and demographics, patient therapy settings, measured and calculated results, system messages, reference and critical ranges	yes/RS-232, parallel, Ethernet options can be customized; direct and measured parameters
Analyzer connections Interface standards supported How analyzer connects to external system to upload patient and QC results	AQURE Point of Care Management System, which connects to LIS/HIS or directly to LIS/HIS ASTM, HL7, serial, POCT1-A, network TCP/IP direct serial, modem dial-in, real-time wireless	AQURE Point of Care Management System, which connects to LIS/HIS or directly to LIS/HIS/CIS ASTM, HL7, POCT1-A, serial, network, TCP/IP direct to HIS/LIS or AQURE Point of Care Management System, which connects to HIS/LIS	cobas bge link software, data-management systems, LIS or HIS ASTM, HL7, USB port Ethernet
Information included in transmission from analyzer to external system	device-unique identifier, operator and patient IDs, results, QC identifier, per ASTM/HL7 standards plus calibration and analyzer status information	device-unique identifier, operator and patient IDs, results, QC identifier	device-unique identifier, operator and patient IDs, results, QC identifier
Hardware and software for data-management system	internal system plus optional external system, AQURE Point of Care Management System	AQURE Point of Care Management System or any other DMS	cobas bge link software
No. of different management reports system produces	user-definable searches and reports	user definable	19 standard reports, plus customized reports; QC and patients results based on user validation rules; related patient RT inputs may be included; lid operator valid operator IDs
Contents downloaded from data-management system to analyzer System connected (live installations) to which LISs, HISs Use a third-party interfacing tool, engine for LIS, HIS interfaces	— Cerner, McKesson, Meditech, Sunquest, many others an interfacing tool or engine could be used if customer requires it	— Cerner, Meditech, Sunquest, others can use interface templates or interface engine	Cerner, Meditech, others Data Innovations
Distinguishing features (supplied by company)	IDMS-traceable creatinine; FLEXQ automated inlet part of automatic system; bilirubin and fetal Hb measured on whole blood with no extra sample volume, low maintenance and cost of operation; FDA approved for the measurement of pleural fluid pH	portable, true battery operation; fast startup, warmup, and analysis time; simple and easy-to-use system with automated quality management system	FDA 510(k)—cleared pH pleural fluid results; 42-day onboard reagent packs; Roche AutoQC with up to 40 days of QC covered; screen sharing and remote protected access with cobas bge link software and Axeda software
<i>Note: a dash in lieu of an answer means company did not answer question or question is not applicable</i>			

IN VITRO BLOOD GAS ANALYZERS

Part 7 of 7	Siemens Healthineers 511 Benedict Ave. Tarrytown, NY 10591 800-255-3232 www.usa.siemens.com/bloodgas	Siemens Healthineers 511 Benedict Ave. Tarrytown, NY 10591 800-255-3232 www.usa.siemens.com/bloodgas
See captodayonline.com/productguides for an interactive version of guide		
Name of device/First year sold/Number of analyzers sold in 2016 Number of devices sold in U.S./Outside U.S./List price Dimensions (H x W x D)/Weight	RAPIDPoint 500 system/2011/— — 21.5 x 11.5 x 16 inches/36.5 pounds	RAPIDLab 1200 Series/2005/— — 57.2 cm (22.5 in) x 58.4 cm (23.0 in) x 55.9 cm (22.0 in)/ 29.5 kg (65 lb)
Analytes measured on device	pH, pCO ₂ , pO ₂ , Hb, Na, K, Cl, iCa, glucose, lactate, neonatal total bilirubin, CO-oximeter fractions (fO ₂ Hb, fCOHb, fMetHb, fHHb), pleural fluid pH, sO ₂	pH, pCO ₂ , pO ₂ , tHb, Na+, K+, Cl-, iCa++, lactate, glucose, F02Hb, FCOHb, FMetHb, FHHb, total neonatal bilirubin
Parameters calculated on device	O2SAT, BE, TC02, HCO3	HCO3-act, HCO3-std, BE(B), BE(ecf), ctCO ₂ , Ca++(7.4), RI(T), O2SAT, PO2/FIO2, AnGAP, sO ₂ , B02, pO2(A-a)(T), pO2(a/A)(T), p50, Qsp/Qt(T), ctO2(Hb), ctO2(a), ctO2(v), ctO2(V), ctO2(a-v), DO2, VO2, others
Barometric pressure	recorded	measured, tracked
Analytical method(s) or technologies employed	pH, iCa, Na, Cl, K: potentiometry using ISE; pCO ₂ : potentiometry based on Severinghaus; pO ₂ : amperometric; glucose: amperometric, glucose oxidase; tHb, CO-ox: spectrophotometric; lactate: amperometric, lactate oxidase	pH: potentiometry; pCO ₂ : Severinghaus electrochemical; pO ₂ : amperometric; Hct: calculated; tHb, CO-ox: spectrophotometric; Na, Cl, iCa, K: ISE; lactate: amperometric, lactate oxidase; glucose: amperometric, glucose oxidase; total neonatal bilirubin: spectrophotometric
Device is part of a series of related models	no	yes (series offers different analyte options)
Device warranty/Loaner devices provided	1 year/no	1 year/no
Average life expectancy of device	7–10 years	7–10 years
Open or closed system/External gas tanks required	closed/no	closed/no
Categorized for point-of-care testing or laboratory	point-of-care testing and laboratory	point-of-care testing and laboratory
Point of care: Disposable prepackaged system used for analysis	multiuse cartridge	multiuse cartridges, electrode measurement chamber
No. of disposable reagent system units in standard package	1 measurement and 1 wash-waste cartridge, 1 AQC cartridge	1 reagent cartridge, 1 wash cartridge
No. of samples analyzed per one disposable reagent, electrode system	100, 250, 400, 750 samples	reagent cartridge is not sample dependent
Reagent unit storage requirements	measurement and AQC cartridge: refrigeration; wash-waste cartridge: room temperature	reagent cartridge and AQC cartridge: refrigeration; wash cartridge: room temperature
Shelf life of disposable units	9 months	reagent, wash cartridge: 8 months; AQC cartridge: 9 months; electrodes: varies based on type
Laboratory: No. of different disposable reagents required to maintain device	1 measurement and 1 wash-waste cartridge, 1 AQC cartridge	1 reagent cartridge, 1 wash cartridge
Max. No. of analyte reagents that can reside in device at once	1 measurement and 1 wash-waste cartridge, 1 AQC cartridge	1 reagent cartridge, 1 wash cartridge, all electrodes
Shelf life of components	cartridge: 9 months	electrodes: based on type; reagent cartridge: 8 months; wash cartridge: 8 months; AQC cartridge: 9 months
Cost per test/Reagent cost per test	—	varies based on configuration/—
Calibrations required	1 and 2 point (manual and automatic)	1 and 2 point (manual and automatic)
Calibration frequency	1 point: 30 minutes; 2 point: 2 hours	1 point: every 30 minutes; 2 point: every 8 hours
Internal QC program recommended	1 AQC cartridge; fully user programmable	AQC cartridge, fully user programmable
QC features/Capabilities of QC features	L-J plots/external RAPIDComm data management, statistical calculations, monthly cumulative reports, onboard Levey-Jennings charts	L-J plots/comparable plots, statistical calculations, monthly cumulative reports (avail. with external system)
Remote control of device from laboratory	yes	yes
System can use LOINC to transmit results to LIS	yes	yes
Specimen types suitable for device	whole blood, capillary, mixed venous, arterial, venous, pleural fluid	whole blood, capillary, mixed venous, arterial, venous
Acceptable anticoagulants/Sampling technique	heparin/aspiration, pleural fluid	heparin/aspiration
Sample size for complete panel of analyte results	100 µL minimum	90–175 µL
Sample size differs with number of analytes selected	no	yes (microsample mode available)
Time from sample introduction to result availability	~60 seconds	60 seconds
Max. No. of patient samples per hour/Max. No. measured results per hour	25/up to 336	24/up to 336 tests
Optimal throughput when analyzer calibrated, awaiting specimens	25 samples per hour	24 samples per hour
Calibration can be interrupted to perform stat sample	yes	yes
Known interferences	benzalkonium	—
Sampler has self-wiping probe	yes	yes
Time required for maintenance by lab personnel	monthly: 1-minute cartridge replacement	weekly: 5 minutes; monthly: 5 minutes
Service center performs diagnostics through modem	yes, via Internet connection and Siemens Remote Service password (customizable)	yes, via Internet connection and Siemens Remote Service password (customizable)
Method of analyst ID in system		
Instrument response for:		
• hardware failure/software failure	diagnostic codes/diagnostic codes	diagnostic codes prompt operator/diagnostic codes prompt operator
• QC failure	fully customizable flags	diagnostic codes
• calibration failure	diagnostic codes	recalibrates, generates diagnostic code if unsuccessful
For what barcode scanning is provided	operator and patient IDs	patient ID, accession number, operator password
Built-in printer/Data port	yes/RS-232, Ethernet, USB	yes/RS-232, Ethernet, USB
Information listed on hard-copy report	operator and patient IDs, accession number, patient measured and calculated results, temperature, more	operator and patient IDs, accession number, results, temperature, patient demographics, others
Analyzer connections	directly to LIS/HIS, data-management system, which connects to LIS/HIS	data-management system, which connects to LIS/HIS; directly to LIS/HIS (both options)
Interface standards supported	LIS 3	LIS 4
How analyzer connects to external system to upload patient and QC results	direct serial, Ethernet	direct serial, hospital network
Information included in transmission from analyzer to external system	device-unique identifier, operator and patient IDs, results, QC identifier	device-unique identifier, operator and patient IDs, results, QC identifier
Hardware and software for data-management system	RAPIDComm data-management system	RAPIDComm data-management system
No. of different management reports system produces	unlimited and fully customizable	customizable
Contents downloaded from data-management system to analyzer	valid control values, operator IDs, patient demographics downloaded for positive patient identification	valid control values, valid operator IDs
System connected (live installations) to which LISs, HISs	yes, with multiple LISs, HISs	yes, with multiple LISs, HISs
Use a third-party interfacing tool, engine for LIS, HIS interfaces	yes	yes
Distinguishing features (supplied by company)	no maintenance, multiuse cartridge; fast time to patient results and sample-to-sample throughput; 28-day onboard, automatic quality control cartridge, onsite application and hardware support; 24/7 call center support	cartridge-based high-throughput analyzer with minimal maintenance; fast time to patient results; onboard troubleshooting tutorials, onsite application and hardware support; 24/7 call center support

Note: a dash in lieu of an answer means company did not answer question or question is not applicable

Tabulation does not represent an endorsement by the College of American Pathologists.

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