

Chemistry analyzers (for low-volume laboratories)

Part 1 of 10	Abaxis Inc. Ron Blasig ronblasig@abaxis.com 3240 Whipple Rd. Union City, CA 94587 800-822-2947 www.abaxis.com
Name of instrument/First year sold in U.S.	Piccolo Xpress/1995
List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents mftd. Operational type/Reagent type	\$22,000 /— 1,500/1,500 U.S./U.S./U.S. self-contained disk with multi-test reagent panel
Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	disk loaded directly into instrument/benchtop 12.75 x 6 x 8/1 sq ft
Tests available on instrument in U.S.	ALP, ALT, AST, GGT, amylase, albumin, total protein, bilirubin total, BUN, creatinine, calcium, cholesterol, glucose, uric acid, sodium, creatine kinase, potassium, TCO ₂ , chloride, cholesterol, HDL ratio, HDL, LDL, triglycerides-VLDL, phosphorus, direct bilirubin, magnesium, LD
Tests cleared but not clinically released Tests not available in U.S. but submitted for 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	— — none —/— none
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reag. pack for each specimen/No. of diff. assays in pack • Separate reag. pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reag. containers onboard at once/Tests per container set Shortest/Median onboard reag. stability/Refrigerated onboard Multiple reag. configurations supported Reag. container placed directly on system for use Instrument has same capabilities when 3rd-party reag. used Reag. only cost per reportable result for standard chemistries/ Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	enzymatic/na na yes/4–14 analytes (chemistries) for 12 diff. chem./elec. profiles; reagent self-contained with each disk no 26 14 0/na 4–14/self-contained disk with reagents 4–12 6 months/12 months/na yes yes na \$0.64/na/na approximately 12/1/14 reconstitutes onboard no/na no/na approximately 100 µL no/no no/na none no no/na yes/—
Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reag. for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/ Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	yes yes na na/yes/yes yes yes/yes yes/no na/na yes yes/yes self-calibrated onboard/disk/—/— yes/yes
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Album., direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC	12 min, 4 specimens 12 min, 4 specimens 12 min, 4 specimens na automatic QC onboard/yes
Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	yes/yes yes
Data mgmt. capability/Instrument vendor supplies LIS interface	onboard/no
Interfaces up and running in active user sites with	20
Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	no yes yes no —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	no na
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	no/yes/yes 24-hr loaner/yes 3 years/— daily: none; weekly: none; monthly: none na/yes yes/yes 1-year warranty, extended warranty—\$1,200
Distinguishing features (supplied by company)	compact chemistry system using a few drops of whole blood, serum, or plasma provides turnaround of results at point of care, including hands-on time in 15 minutes

An array of possibilities

CAP TODAY's lineup of chemistry analyzers for low-volume laboratories, which begins here, features 20 systems from 16 vendors.

Joining the annual lineup are the following five analyzers:

■ Hemagen Diagnostics' Analyst III, which uses only 90 µL of sample and requires less than 60 seconds of preparation work.

■ Horiba ABX's ABX Pentra 400, which can run more than 53 assays, with room for 55 tests onboard at once. It boasts a throughput of 420 tests per hour.

■ Medica's Easy RA, which is awaiting FDA 510(k) clearance. The analyzer offers radiofrequency identification-tagged reagents for reading and writing capability and features easy-to-replace components inside a slide-out drawer.

■ Response Biomedical's Ramp, which features two levels of control performed with every test.

■ SDI Biomed's SDI CA480 clinical chemistry system, which has an onboard jet wash/dry system and a notebook-like operator interface.

Also profiled this year are instruments from Abaxis, Abbott Point of Care, Alfa Wassermann Diagnostic Technologies, Beckman Coulter, Dade Behring, Nova Biomedical, Ortho-Clinical Diagnostics, Randox Laboratories, Roche Diagnostics, Thermo Fisher Scientific, and Vital Diagnostics.

Readers interested in a particular analyzer should confirm that it has the stated features and capabilities. □

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at Booth #122**

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

<p>Part 2 of 10</p> <p><i>See accompanying article on page 25</i></p>	<p>Abbott Point of Care Glen Tinevez glen.tinevez@abbott.com 104 Windsor Center Dr. East Windsor, NJ 08520 800-827-7828 www.abbottpointofcare.com</p>	<p>Alfa Wassermann Diagnostic Technologies LLC info@alfawassermannus.com 4 Henderson Dr. West Caldwell, NJ 07006 800-220-4488 www.alfawassermannus.com</p>
<p>Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type</p>	<p>i-Stat 1 analyzer/2000 \$8,761/— 30,000+ worldwide U.S./U.S./Canada —/self-contained single-use cartridges packages-slides</p>	<p>ACE/1993; ACE Alera Clinical Chemistry System/2004 \$69,995/— 1,100+/600+ U.S./U.S./U.S. batch, random access, discrete, cont. random access, stat/closed reagent system with open reagent system channel ring with up to 5 segments (15 samples/seg.)/benchtop ACE: 15.75 x 27.25 x 22.50; ACE Alera: 18 x 27.5 x 22.5/4.3 sq ft</p>
<p>Tests available on instrument in U.S.</p> <p>Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes</p>	<p>tropinin I, CK-MB, lactate, BUN, creatinine, glucose, ionized calcium, sodium, potassium, chloride, hematocrit, pH, PCO₂, PO₂, TCO₂, ACTc, ACTk, PT/INR; calculated: hemoglobin, HCO₃, BEecf, SO₂, anion gap</p> <p>na BNP na na/na na</p>	<p>albumin, gamma GT, bilirubin direct & total, calcium, creatinine, glucose, inorganic phosphorus, total iron, magnesium, total protein, BUN, uric acid, amylase, AST (GOT), alkaline phosphatase, ALT (GPT), CK, LDH, cholesterol, HDL-C, LDL-C, triglycerides, sodium, potassium, chloride, CO₂, digoxin, T4, T-uptake, HbA1c, lipase, direct TIBC, ferritin</p> <p>none none UIBC none/homocysteine, Lp(a), microalbumin, ApoA1, Apo B, transferrin open channel bottles are available for user-derived or third-party reagents</p>
<p>Methods supported/Immunoassay methods</p> <p>No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run</p> <p>No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set</p> <p>Shortest/Median onboard reagent stability/Refrigerated onboard</p> <p>Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes</p> <p>Walkaway capacity in minutes/No. of specimens/No. of tests-assays</p> <p>System is liquid, dry, or reconstituted onboard</p> <p>Uses disposable cuvettes/Max. No. stored</p> <p>Uses washable cuvettes/Replacement frequency</p> <p>Minimum sample volume aspirated precisely at one time</p> <p>Supplied with UPS (backup power)/Requires floor drain</p> <p>Requires dedicated water system/Water consumption in L per hour</p> <p>Noise generated in decibels</p> <p>Dedicated pediatric sample cup/Dead volume</p> <p>Primary tube sampling/Pierces caps on primary tubes</p> <p>Sample bar-code reading capability/Autodiscrimination</p> <p>Reagent bar-code reading capability</p> <p>Bar-code placement per CLSI standard Auto2A</p> <p>Onboard test auto inventory (determines volume in container)</p> <p>Measures No. of tests remaining/Short sample detection/Clot detection</p> <p>Automatic detection of adequate reagent for aspirate & analysis</p> <p>Hemolysis/Turbidity detection-quantitation</p> <p>Dilution of patient samples onboard/Automatic rerun capability</p> <p>Sample volume can be reduced to rerun out-of-linear-range high results/Increased to rerun out-of-linear-range low results</p> <p>Autocalibration or autocalibration alert</p> <p>Calibrants stored onboard/Multipoint calibration supported</p> <p>Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse</p> <p>Automatic shutdown/Startup programmable</p>	<p>potentiometry, amperometric, conductometric/—</p> <p>10 yes/up to 13</p> <p>yes na</p> <p>18</p> <p>na/na</p> <p>na/unit use</p> <p>na/14 days/no</p> <p>no na na</p> <p>based on volume/na/based on volume</p> <p>2 min/1/up to 18</p> <p>—</p> <p>no/—</p> <p>no/—</p> <p>16 µL</p> <p>no/no</p> <p>no/na</p> <p>none</p> <p>no/na</p> <p>no/no</p> <p>yes, shortly before sample is aspirated, by handheld scanner as tubes are loaded, at the bedside (2 of 5 interleaved, Codabar, codes 39 & 128)/yes</p> <p>yes yes na na/yes/yes yes no/no no/no no/no</p> <p>yes no/yes</p> <p>each test/each test/—/—</p> <p>yes/yes</p>	<p>photometry, potentiometry, turbidimetric/homogeneous EIA</p> <p>3 no/na</p> <p>no 40 200</p> <p>15/15</p> <p>40/30–250 tests per bottle</p> <p>5 days/30 days/yes (10°C to 14°C)</p> <p>yes yes yes</p> <p>\$0.16/\$3.50/\$3.50</p> <p>75/75/248</p> <p>liquid yes/248</p> <p>no/na</p> <p>3 µL</p> <p>yes/no</p> <p>no/na</p> <p>55</p> <p>no/na</p> <p>yes/yes</p> <p>yes, as sample is being aspirated (2 of 5 interleaved, Codabar, code 39, code 128 set B & C)/yes</p> <p>yes, proprietary dot coding</p> <p>no yes yes/yes/no yes bichromatic correction for both yes/yes yes/no</p> <p>yes no/yes</p> <p>3 hr/30 days/45 days with 48 hr updates/na</p> <p>na/na</p>
<p>Stat time to completion of all analytes, throughput per hr. for:</p> <p>• Sodium, potassium, chloride, TCO₂</p> <p>• Sodium, potassium, chloride, TCO₂, glucose, urea, creatinine</p> <p>• Albumin, direct & total bili., AST, ALT, ALP</p> <p>Typical time delay from ordering stat test to aspirate of sample</p> <p>How often QC required/Onboard SW capability to review QC</p> <p>Onboard real-time QC/Support multiple QC lot Nos. per analyte</p> <p>QC results transferred automatically to LIS</p>	<p>2 min, na</p> <p>2 min, na</p> <p>na, na</p> <p>none</p> <p>shortest interval: 24 hr; longest interval: each new lot or reagent/yes</p> <p>yes/yes</p> <p>yes</p>	<p>4 min, 35 specimens</p> <p>7 min, 20 specimens</p> <p>10 min, 12 specimens</p> <p>immediate response, as soon as 10 sec</p> <p>daily/yes</p> <p>yes/yes</p> <p>yes</p>
<p>Data mgmt. capability/Instrument vendor supplies LIS interface</p> <p>Lab information systems with which interfaces are currently up and running in active user sites</p> <p>Bidirectional interface capability</p> <p>Test results transmitted to LIS as soon as chem. time complete</p> <p>LIS interface operates simultaneously with running assays</p> <p>Uses LOINC to transmit orders & results</p> <p>How labs get LOINC codes for reagent kits</p>	<p>optional add-on (<\$30,000, SW mfr: Abbott Point of Care)/yes (add'l cost)</p> <p>all systems</p> <p>yes (broadcast download & host query)</p> <p>yes yes yes yes</p> <p>customized on site</p>	<p>onboard/no</p> <p>Schuyler House, Antek, LabPak, others</p> <p>yes (broadcast download)</p> <p>yes, when requisition is done</p> <p>yes no na</p>
<p>Lab can control analyzer remotely</p> <p>Interface avail. (or will be) to automated specimen handling system</p>	<p>yes na</p>	<p>no no</p>
<p>Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component</p> <p>On-site time of svc. engineer/Onboard error codes for troubleshooting</p> <p>Mean time between failures/To repair failures</p> <p>Average time to complete maintenance by lab personnel</p> <p>Onboard maintenance records/Maint. training demo module</p> <p>Training provided with purchase/Advanced oper. training avail.</p> <p>Annual service contract cost (24 h/7 d)</p>	<p>yes/yes/yes</p> <p>replacement within 24 hr/yes</p> <p>not determined/replacement within 24 hr</p> <p>daily: none; weekly: none; monthly: none</p> <p>na/na</p> <p>—/yes</p> <p>\$750</p>	<p>no/yes/yes</p> <p>24 hr/yes</p> <p>2 per yr/1 hr</p> <p>daily: 15 min; weekly: 30 min; monthly: 60 min</p> <p>yes/no</p> <p>4.5 days at manufacturer's facility/yes</p> <p>varies, several programs available</p>
<p>Distinguishing features (supplied by company)</p>	<p>handheld portable analyzer; unit use system can perform chemistry, blood gas, cardiac marker, and coagulation tests on two drops of whole blood or plasma</p>	<p>easy-to-use, multitasking software; closed-tube sampling; stat interrupt capability; extensive test menu; onboard sample and reagent refrigeration; onboard reagent inventory management; liquid, ready-to-use reagents; integrated ISE module; dedicated field service organization; self-contained analyzer; no external water source or waste drainage</p>

Chemistry analyzers (for low-volume laboratories)

**SURVEY OF
INSTRUMENTS**

Part 3 of 10 <i>See accompanying article on page 25</i>	Beckman Coulter Inc. 200 South Kraemer Blvd. P.O. Box 8000 Brea, CA 92822-8000 800-526-3821 www.beckmancoulter.com	Beckman Coulter Inc. 200 South Kraemer Blvd. P.O. Box 8000 Brea, CA 92822-8000 800-526-3821 www.beckmancoulter.com
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	Synchron CX4 Pro/2001 \$162,400/— —/— U.S./U.S./U.S. & Ireland continuous random access/open reagent system sectors, centrifugable/floor-standing 69 x 47 x 30/9.8 sq ft	Synchron CX5 Pro/2001 \$193,500/— —/— U.S./U.S./U.S. & Ireland continuous random access/open reagent system sectors, centrifugable/floor-standing 69 x 61 x 30/12.7 sq ft
Tests available on instrument in U.S. Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	alb, ALP, ALT, amylase, AST, BUN, calc., CO ₂ , chloride, cholest., CK-MB, creatinine, dir. bilirubin, GGT, glucose, HDL ₂ , iron/TIBC, lipase, LD, LDL ₂ , Mg, phosphorus, potassium, sodium, total protein, total bilirubin, triglyceride, triglyceride glycerol blanked, urea, uric acid; esoteric chemistries: ammonia, cholinesterase, hemoglobin A1c, lactate, microalbumin, prealbumin, salicylate; drugs of abuse testing; therapeutic drug monitoring; proteins: anti-streptolysin O, IgA, IgM, IgG, rheumatoid factor, transferrin; thyroids: thyroxine, T-up, P-amylase, C-reactive protein, creatine kinase none none none none/none UIBC, cyclosporine, homocysteine, lithium, ecstasy	alb, ALP, ALT, amylase, AST, BUN, calc., CO ₂ , chloride, cholest., CK-MB, creatinine, dir. bilirubin, GGT, glucose, HDL ₂ , iron/TIBC, lipase, LD, LDL ₂ , Mg, phosphorus, potassium, sodium, total protein, total bilirubin, triglyceride, triglyceride glycerol blanked, urea, uric acid; esoteric chemistries: ammonia, cholinesterase, hemoglobin A1c, lactate, microalbumin, prealbumin, salicylate; drugs of abuse testing; therapeutic drug monitoring; proteins: anti-streptolysin O, IgA, IgM, IgG, rheumatoid factor, transferrin; thyroids: thyroxine, T-up, P-amylase, C-reactive protein, creatine kinase none none none none/none UIBC, cyclosporine, homocysteine, lithium, ecstasy
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reagent for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/ Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	photometry, potentiometry, turbidimetric/bidentate turbidimetric, direct turbidimetric, particle enhanced turbidimetric, enzyme immunoassay na no/— no 24 50 96/24 24/2,400–9,600 (100–900 tests per container) 168 hr/30 days/yes (2° to 8°C) yes yes yes assay dependent/—/— 400/63/1,512 liquid no/na yes/permanent–2-yr warranty (80 stored on instrument) 3 µL yes/no yes/7 L 70 yes/40 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 & 128)/yes yes yes yes yes/yes/yes yes yes/yes yes/no yes/no yes no/yes na/up to 90 days/60 days/14 days none required	photometry, potentiometry, turbidimetric/bidentate turbidimetric, direct turbidimetric, particle enhanced turbidimetric, enzyme immunoassay 5 (indirect) no/— no 29 50 100/29 29/2,900–69,600 (100–2,400 tests per container) 168 hr/30 days/yes (2° to 8°C) yes yes yes assay dependent/—/— 400/63/1,827 liquid no/na yes/permanent–2-yr warranty (80 stored on instrument) 3 µL yes/no yes/7 L 70 yes/40 µL yes/no yes (2 of 5 interleaved, Codabar, codes 39 & 128)/yes yes yes yes yes/yes/yes yes yes/yes yes/no yes/no yes no/yes 24 hr/up to 90 days/60 days/14 days none required
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Album., direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	na, na na, na 10 min, 32 specimens 45 sec 24 hr/yes yes/yes yes	52 sec, 75 specimens 8 min, 75 specimens 10 min, 32 specimens 45 sec 24 hr/yes yes/yes yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	onboard & optional add-on (SW mfr: Beckman Coulter DL2000)/yes (add'l cost) Cerner, Misys, Meditech, Citation, MedLab, CHC, Siemens, McKesson, Labquest, CCA, VA-Mumps, others yes (broadcast download & host query) yes yes no —	onboard & optional add-on (SW mfr: Beckman Coulter DL2000)/yes (add'l cost) Cerner, Misys, Meditech, Citation, MedLab, CHC, Siemens, McKesson, others yes (broadcast download & host query) yes yes no na
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	no yes	no yes
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	yes/yes/no metro: same day; rural: same or next day/yes —/— daily: 5 min; weekly: 15 min; monthly: 20 min no/no 1 day on site, 5 days at vendor offices/no —	yes/yes/no metro: same day; rural: same or next day/yes —/— daily: 5 min; weekly: 15 min; monthly: 20 min no/no 1 day on site, 5 days at vendor offices/no —
Distinguishing features (supplied by company)	serum indices; centrifugable sectors; clot detection; bar-coded calibrators and controls; host query; reagent load while running; ready-to-use liquid reagents; Peltier thermal ring; pulsed xenon light source; polychromatic correction; semipermanent glass cuvettes; available DL2000 Sample Manager	serum indices; centrifugable sectors; clot detection; bar-coded calibrators and controls; host query; reagent load while running; ready-to-use liquid reagents; Peltier thermal ring; ISE system; pulsed xenon light source

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 4 of 10	Dade Behring Inc. 1717 Deerfield Rd. Deerfield, IL 60015 800-242-3233 www.dadebehring.com	Hemagen Diagnostics Inc. Jim Miller jmill@hemagen.com 9033 Red Branch Rd. Columbia, MD 21045 443-367-5500 www.hemagen.com
<i>See accompanying article on page 25</i>		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	Dimension Xpand Plus Integrated Chemistry System/2004 —/— —/— U.S./U.S./U.S. continuous random access/self-contained single-use & multi-use cartridges racks/floor-standing 45 x 51 x 31 (without monitor)/10.6 sq ft	Analyst III/2007 \$12,500/0 0/0 France/France/U.S. discrete/self-contained single-use cartridges-packages-slides built-in pipettor/benchtop 10 x 13 x 15/1 sq ft
Tests available on instrument in U.S. Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analyte	ser. acetamino., acid phos., alb., alk. phos., ALT, ammonia, amylase, AST, automated HDL & LDL, C3 compl., C4, calc., carbamaz., CO ₂ , chlor., cholesterol, CRP, creat. kin., creatinine, CK-MB isoenzyme, digitoxin, digoxin, ethyl alcohol, gentamicin, GGT, glucose, HbA1c, IgA/G/M, iron, lactic acid, LDH, lidoc., lipase, lith., magnes., microalb., n-acetylprocain., NT-pro BNP, phenobart., pheny., phosphorus, potas., prealbum., procainam., pseudocholesterol, ser. salicyl., sod., ser. TCA, theophyl., thyronine uptake, TIBC, tobramycin, tot. protein, tPSA, tot. T4/thyroxine, transferrin, triglycerides, urea nitrog., uric acid, urine amphet. Screen, urine barbitura. screen, benzodiazep., cannabinoids, cocaine metabolite, methadone, opiates, phencyclidine, TBIL, DBIL, cyclosporine, ferritin, fPSA, free T4/thyroxine, hCG, myoglobin, TSH, triiodothyronine, trop. I, urine/CSF protein, valporic acid, vancomycin, tacrolimus, serum barb., serum benzodiazep., serum TCA, urine ecstasy, urine propoxy, cyclosporine ext. range	ALP, GGT, GPT, GOT, BUN, glucose, calcium, cholesterol, creatinine, triglycerides, amylase, uric acid, total bilirubin, total protein, HDL cholesterol ALB, CO ₂ , Phos, CK na na na/sodium, potassium, chloride, T4, lipase na
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reagent for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	photometry, potentiometry, turbidimetric assays/Integrated Multisensor Technology, heterogenous EIA using HM, Emit, latex turbidimetric 3 no/— no 47 190 10/10 47/15-360 72 hr/30 days/yes (2° to 8°C) yes yes yes —/—/— can be hrs/60/>1,000 liquid, no reagent prep required by operator yes/12,000 no/— 2 µL yes/no yes/up to 4 to 4.5 µL <70 no/20 µL yes/no yes (2 of 5 interleaved, Codabar, codes 39 & 128)/yes yes yes yes yes/yes/no yes yes/yes yes/yes yes/yes yes yes(Na, K, Cl)/yes every 2 hrs, autocalibrate/—/60-90 days/30 days not required/—	photometry/— 0 yes/14 no 14 14 0/0 —/14 8 hours/1 day/yes no yes no \$0.66/na/na 10/1/14 reconstituted yes/na no/— 10 µL no/no no/— unknown, very low no/— no/no no/— no no no —/—/— — —/— yes/no —/— yes —/— —/monthly/—/— no/no
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Album., direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	2 min, 62 specimens 4 min, 62 specimens 8 min, 62 specimens 60 sec steady state, 2 min from standby daily/yes yes/yes yes	—, — 11 min, 4 specimens 11 min, 4 specimens — —/— no/no yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	optional add-on/yes (additional cost) interfaces available for all major LIS vendors yes (broadcast download & host query) yes yes no —	—/— — no yes yes no —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	no no	no no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	yes/yes/yes 2-8 hr/yes —/— daily: 5 min; weekly: 10 min; monthly: 15 min no/no 5 days on site, 4 days at vendor offices/no multiple types	no/—/— na/— — na —/— 1 day on site/— \$1,250
Distinguishing features (supplied by company)	consolidated low-volume workstation integrates immunoassays onboard with other chemistries; allows single platform to meet more than 95 percent of testing needs; eliminates sample splitting, aliquotting	uses only 90 µL of sample & requires less than 60 seconds of prep work; minimal maintenance required; offered with sodium, potassium, and chloride ISE units

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

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 5 of 10	Horiba ABX Donna Merithew dmerithew@us.abx.fr 34 Bunsen Dr. Irvine, CA 92618 888-903-5001 www.horiba-abx.com	Medica Corporation Charlene Soley csoley@medicacorp.com 5 Oak Park Drive Bedford, MA 01730 781-275-7425 www.medicacorp.com
See accompanying article on page 25		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	ABX Pentra 400/2006 \$89,000/21 60/500 France/France/France batch, random access, discrete, continuous random access/self-contained single-use cartridges-packages-slides, open reagent system	Easy RA/— —/— —/— U.S./U.S./U.S. batch, random access, discrete, continuous random access self-contained multi-use cartridge/packages/slides
Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	rack/benchtop 25 x 40 x 28 in/7.7 sq ft	—/benchtop 15 x 40 x 26/—
Tests available on instrument in U.S.	albumin, calcium, sodium, alk phos, ALT, carbon dioxide, glucose (PAP), lipase, total protein, chloride, glucose (hexokinase), magnesium, triglycerides, amylase, cholesterol, nitrogen, iron, myoglobin, uric acid, total bilirubin, creatinine, lactic acid, phosphorus, direct bilirubin, potassium, HDL, CK, CRP, GGT, LDH, LDL, micro, urea, nitrogen	none
Tests cleared but not clinically released	na	none
Tests not available in U.S. but submitted for FDA 510(k) clearance	na	glucose-trinder, sodium, potassium, chloride, lithium, calcium, cholesterol
Tests not available in U.S. but available in other countries	Alpha 1 antitrypsin, C3, C4, ceruloplasmin, orosomucoid, heparin, kappa chains, lambda chains	none
Research-use-only assays/Tests in development	—/TDMS, DAUs	—/albumin, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, blood urea nitrogen, creatinine, GLU-H, direct bilirubin, total bilirubin, GGT, HDL cholesterol, LDH, total protein, triglycerides, uric acid, phosphorus, magnesium, CO ₂ , CK, amylase, iron, creatinine (urine)
User-defined methods implemented for what analytes	alcohol, apolipoprotein A1, apolipoprotein B, beta 2, microglobulin, ferritin, fructosamine, glyco mark, haptoglobin, Hgb A1c, homocysteine, HS CRP, IgA, IgG, IgM, pre albumin, rheumatoid factor, TIBC, transferrin, UIBC	—
Methods supported/Immunoassay methods	photometry, potentiometry (ion selective electrode), turbidimetric/—	photometry, potentiometry
No. of direct ion selective electrode channels	3	4
• Must load separate reagent pack for each specimen/No. of diff. assays in pack	no/—	no/—
• Separate reagent pack for each test run	no	no
No. of different measured assays onboard simultaneously	55	28
No. of different assays programmed, calibrated at once	55	28
No. of user-definable (open) channels/No. active simultaneously	15/15	0/na
No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set	55/100 to 400	28/80 to 250
Shortest/Median onboard reagent stability/Refrigerated onboard	8 hours/30 days/yes (15° to 32°C)	168 hrs/30 days/yes
Multiple reagent configurations supported	yes	yes
Reagent container placed directly on system for use	yes	yes
Instrument has same capabilities when 3rd-party reagent used	yes	na
Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes	—/—/—	\$0.16/—/—
Walkaway capacity in minutes/No. of specimens/No. of tests-assays	2 hrs/60/—	36/24/28
System is liquid, dry, or reconstituted onboard	liquid	liquid
Uses disposable cuvettes/Max. No. stored	yes/432	yes/72
Uses washable cuvettes/Replacement frequency	no/—	no/na
Minimum sample volume aspirated precisely at one time	2 µL	2 µL
Supplied with UPS (backup power)/Requires floor drain	no/no	no/no
Requires dedicated water system/Water consumption in L per hour	no/avg. 0.5 L	no/—
Noise generated in decibels	<66	minimal
Dedicated pediatric sample cup/Dead volume	no/—	no/—
Primary tube sampling/Pierces caps on primary tubes	yes/no	yes/no
Sample bar-code reading capability/Autodiscrimination	yes/no	yes
Reagent bar-code reading capability	yes	na; RFID
Bar-code placement per CLSI standard Auto2A	yes	—
Onboard test auto inventory (determines volume in container)	yes	yes
Measures No. of tests remaining/Short sample detection/Clot detection	yes/yes/yes	yes/yes/no
Automatic detection of adequate reagent for aspir. & analysis	yes	yes
Hemolysis/Turbidity detection-quantitation	yes/yes	no/no
Dilution of patient samples onboard/Automatic rerun capability	yes/yes	yes/yes
Sample volume can be reduced to rerun out-of-linear-range high results/Increased to rerun out-of-linear-range low results	yes/yes	yes/no
Autocalibration or autocalibration alert	yes	yes
Calibrants stored onboard/Multipoint calibration supported	yes/yes	no/yes
Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse	2 hrs/14 days/—/—	8 hrs/30 days/—/—
Automatic shutdown/Startup programmable	no/yes	no/no
Stat time to completion of all analytes, throughput per hr. for:		
• Sodium, potassium, chloride, TCO ₂	<5 min, —	3 min, 200 specimens
• Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine	7.5 min, 35 specimens	8 min, 100 specimens
• Album., direct & total bili., AST, ALT, ALP	<11 min, 23 specimens	9 min, —
Typical time delay from ordering stat test to aspir. of sample	1–2 min	—
How often QC required/Onboard SW capability to review QC	8 hr/yes	CLIA minimum/yes
Onboard real-time QC/Support multiple QC lot Nos. per analyte	yes/yes	no/yes
QC results transferred automatically to LIS	yes	yes
Data mgmt. capability/Instrument vendor supplies LIS interface	onboard/no	onboard/yes
Lab information systems with which interfaces are currently up and running in active user sites	Antek, Fletcher Flora, Orchard, Schuyler House	—
Bidirectional interface capability	yes	yes
Test results transmitted to LIS as soon as chem. time complete	yes	yes
LIS interface operates simultaneously with running assays	yes	yes
Uses LOINC to transmit orders & results	no	no
How labs get LOINC codes for reagent kits	—	—
Lab can control analyzer remotely	no	no
Interface avail. (or will be) to automated specimen handling system	no	no
Modem servicing available/Can diagnose own malfunctions/Determine malfunctioning component	no/no/no	no/yes/yes
On-site time of svc. engineer/Onboard error codes for troubleshooting	<24 hrs/yes	—/yes
Mean time between failures/To repair failures	—/ <24 hrs	1 year/—
Average time to complete maintenance by lab personnel	daily: 5 min; weekly: 5 min; monthly: 15 min	daily: 20 min; weekly: —; monthly: 30 min
Onboard maintenance records/Maint. training demo module	yes/no	no/no
Training provided with purchase/Advanced oper. training avail.	5 days at vendor office/yes	—/—
Annual service contract cost (24 h/7 d)	—	—
Distinguishing features (supplied by company)	flexibility to run more than 53 assays with room for 55 tests onboard at once; high throughput of up to 420 tests per hour; clot level and crash protection on a benchtop analyzer; auto rerun, autocalibration, and autodilution; user-friendly, color-coded touchscreen for easy operation; ability to run up to three reagents on a single assay; most reagents in plug-and-play cassettes	pending 510(k) clearance; simplified user interface accessed through a touchscreen display; RFID-tagged reagents allow for reading and writing capability; all reagent parameters programmed on the wedge, no data entry; easy-to-replace components all located in a slide-out drawer; comprehensive inventories of all system components

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 6 of 10	Nova Biomedical Corp. info@novabiomedical.com 200 Prospect St. Waltham, MA 02454-9141 800-458-5813 www.novabiomedical.com	Nova Biomedical Corp. info@novabiomedical.com 200 Prospect St. Waltham, MA 02454-9141 800-458-5813 www.novabiomedical.com
<i>See accompanying article on page 25</i>		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	Stat Profile Critical Care Xpress/2002 \$25,000–\$59,000/na —/— U.S./U.S./U.S. discrete/self-contained multi-use cartridges sample automatically drawn from syringe, capillary, or open tube/benchttop 17.2 x 17.3 x 22.3/2.7 sq ft	Stat Profile pHox series/1998 \$12,000–\$32,000/na —/— U.S./U.S./U.S. discrete/self-contained multi-use cartridges-packages-slides sample automatically drawn from syringe, capillary, or open tube/benchttop 15 x 15 x 18/1.9 sq ft
Tests available on instrument in U.S. Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	pH, PCO ₂ , PO ₂ , SO ₂ %, hematocrit, hemoglobin, sodium, potassium, chloride, ionized calcium, ionized Mg, glucose, BUN, creatinine, lactate, bilirubin, deoxyhemoglobin, oxyhemoglobin, methemoglobin, carboxyhemoglobin none none none none none	pH, PCO ₂ , PO ₂ , SO ₂ %, hematocrit, hemoglobin, sodium, potassium, chloride, ionized calcium, glucose, lactate none none none none none
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	potentiometry (ISE), optical, reflectance/na 12 no/na no 20 20 0/na 20/200–500 samples (2,600–6,500 tests), depending on lab 45 days/45 days/no na requires operator prehandling, preparation na \$.06–\$.28 per test (cost varies with volume); bundled instr. reagent maint. cost per result \$.07–\$.31 per test (5-yr reagent rental)/na/na na/na/na ISE no/na no/na 60 µL no (optional)/no no/na minimal no/na yes/no yes (optional), by handheld scanner as tubes are loaded onto instrument (2 of 5 interleaved, UPC, Codabar, codes 39 & 128)/yes yes no yes yes/yes/yes yes yes (on co-oximeter module)/yes (on co-oximeter module) yes (on co-oximeter module)/no no/no yes yes/yes 30–120 min/30–120 min/na/na yes/yes	potentiometry (ISE), optical, reflectance/na 5 no/na no 11 11 0/na 11/varies by analyzer and laboratory use pattern 45 days/45 days/no na requires operator prehandling, preparation na varies by model/na/na na/na/na ISE no/na no/na 45 µL no (optional)/no no/na minimal no/na yes/no yes, by handheld scanner as tubes are loaded onto instrument (2 of 5 interleaved, UPC, Codabar, codes 39 & 128)/yes yes no yes yes/yes/yes yes yes*/yes* yes*/no no/no yes yes/yes 30–120 min/30–120 min/na/na yes/yes
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Albumin, direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	50 sec, 26–36, depending on use mode 123 sec, 21–24, depending on use mode na, na <2 sec 8 hr/yes yes/yes yes	50 sec, 44 na, na na, na <2 sec 8 hr (CLIA)/yes yes/yes yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	onboard/no na yes yes yes no na	no/no virtually all yes (broadcast download & host query) yes yes no na
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	yes no	yes no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	yes/yes/yes <8 business hr/yes na/na daily: none; weekly: <5 min; monthly: <15 min yes (includes audit trail of who replaced parts)/yes 1 day on site/yes \$3,750–\$7,685	yes/yes/yes <8 business hr/yes na/na daily: none; weekly: <5 min; monthly: <15 min yes/yes 1 day on site/yes varies by analyzer configuration & geographic location; discounts for multiple-year contract or 5-year reagent rental or lease
Distinguishing features (supplied by company)	comprehensive 19-test critical care profile, including ionized Mg, BUN, and creatinine; color touchscreen; integrated co-oximeter; open software architecture; onboard data management; automated onboard quality control; sealed waste system; auto-monitoring of QC and reagent packs; tankless gas calibration; automated maintenance	onboard quality control; liquid calibration eliminates gas tanks; remote control; remote review; space-saving design

*on co-oximeter module

Chemistry analyzers (for low-volume laboratories)

Part 7 of 10	Nova Biomedical Corp. info@novabiomedical.com 200 Prospect St. Waltham, MA 02454-9141 800-458-5813 www.novabiomedical.com	Ortho-Clinical Diagnostics Sales Support 1001 U.S. Highway 202 Raritan, NJ 08869 800-828-6316 www.orthoclinical.com
<i>See accompanying article on page 25</i>		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	Nova 16/1995 \$22,500-\$25,500/na —/— U.S./U.S./U.S. batch, random access/self-contained multiuse cartridges 40-position tray, stat sampling directly from sample container/benchtop	Vitros DT 60 II Chemistry System (DT 60 II, DTE, DTSC)/1993 —/— 15,000 units worldwide U.S./U.S./U.S. batch, random access, discrete/self-contained single-use cartridges-packages-slides —/benchtop
Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	20.5 x 19.2 x 20.7/2.75 sq ft	6.75 x 18.75 x 13.75/1.8 sq ft (DT 60 II)
Tests available on instrument in U.S.	sodium, potassium, chloride, total CO ₂ , glucose, BUN, creatinine, Hct	ammonia, cholesterol, HDL chol., neonatal bilirubin, total protein, amylase, creatinine, lactate, phosphorus, triglycerides, BUN-urea, glucose, Mg, total bilirubin, uric acid, albumin, AST, CK, GGT, lipase, ALP, calcium, iron, lithium, ALT, cholinesterase, LDH, theophylline, CO ₂ , sodium, potassium, chloride, urine creatinine, CK-MB
Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	none none none none/none none	none none none none/none none
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/ Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	potentiometry/na 8 no/na no 8 8 0/na 8/(@ 8,000 tests/mo): 2,700 tests 21 days/21 days/no na no, requires prehandling (remove clip from sealed bag & mix) na standard chemistries: @25 sam/d: \$0.40 (8-test panel); bundled instr., reagent, maint. cost per result: \$0.92 (8-test panel)/—/— 60 per tray/40 per tray/280 per tray na na no/na na/na 50 µL no/no no/na minimal na yes/no yes, by handheld scanner as tubes are loaded onto instrument (2 of 5 interleaved, UPC, Codabar, codes 39 & 128)/yes alternate method na yes no/yes/yes yes no/no yes/yes no/no yes yes/na 2 hr/2 hr/na/na na/na	potentiometry, colorimetric, enzymatic/na 4 yes/1 yes one per module (DT 60 II, DTE II, DTSC II) 1 none na/na na/na/no no no na/na/na dry no/na no/na 10 µL no/no no/none — na no/no no/— yes — na na/na/na na no/no no/no no/no no no/yes reagent lot changes no/no
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Albumin, direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	52 sec, 69 specimens 85 sec, 45 specimens na, na 9 sec CLIA minimum/yes no/yes yes	15 tests 75 tests 20 tests none every 24 hr/no no/no yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	onboard & optional add-on (\$9,225, SW mfr: Nova)/no most LIS vendors including Cerner, Misys, McKesson, Soft, others yes yes no no —	—/no — no yes yes — —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	yes no	no no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	no/yes/yes —/yes na/na daily: <2 min; weekly: <5 min; monthly: <5 min no/no 2 days on site/yes call for pricing	no/yes/yes —/yes —/— daily: 5 min; weekly: 5 min; monthly: none no/no yes/— —
Distinguishing features (supplied by company)	whole blood analyzer for creatinine & TCO ₂ ; can analyze whole blood, serum, plasma, urine, CSF, and dialysate	disposable tips eliminate sample carryover; random access testing so chemistries can be run in any order, with no reagent prep.; indiv. packaged test slides elim. waste and facilitate rapid analysis; dry-slide technology minimizes the effects of interferences to provide accurate results

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 8 of 10 <i>See accompanying article on page 25</i>	Randox Laboratories marketing@randox.com 4065 Oceanside Blvd., Ste. Q Oceanside, CA 92056 760-639-1500 www.randox.com	Response Biomedical Corporation Marcia Zucker mzucker@responsebio.com 100-8900 Blenlyon Parkway Brnaby, BC, V5J 5J8 Canada 732-603-1194 www.responsebio.com
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	Rx Daytona/2005 —/— >800 units worldwide Japan/Japan/U.K. random access, discrete/self-contained multi-use cartridges-packages-slides removable ring/benchtop 30.2 x 24.8 x 20.2 sq ft/—	Ramp/2005 available upon request/— 25/700+ Canada/Canada/Canada discrete/self-contained single-use cartridges-packages-slides —/handheld 6 x 10.5 x 10/—
Tests available on instrument in U.S. Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	*acid phos., alb., aldolase, ALT, ammonia, alk. phos., AST (GOT), amylase, panc. amylase, bilirubin (direct/total), calcium, total CO ₂ , cholesterol, HDL-C, LDL-C, CK-NAC, CK-MB, complement C3/C4, copper, CRP, HS CRP, FR CRP, creatinine, ferritin, fructosamine, glucose, GGT, HbA1c, IgA, IgE, IgG, IgM, LDH, lipase, lithium, ASO, lipoprotein(a), ApoA1, ApoB, microalb., magnes., myoglobin, sodium, prealbumin, phosphorus, potas., RF, iron, phenobarbital, phenytoin, digoxin, digitoxin, theophylline, gentamicin, valp. acid, carbamazepine, transferrin, TIBC, total protein, triglycerides, uric acid, BUN/urea, urinary protein, zinc, ISE Na, others — — — *acetic acid, Apo E, Apo CIII, Apo CII, ApoAII, alpha-1-antitryp, α-1-acid glycoprotein, bile acids, butyryl choline., others/— acetaminophen, drugs of abuse, salicylate cyclosporine, alcohol, glycerol-3-phosphate, oxidase, phospholipids, maltose, T4, T-uptake	troponin I, anthrax, CK-MB, botulinum, myoglobin, ricin, pox — NT-proBNP, influenza A/B NT-proBNP, BNP —/— —
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reagent for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	photometry, potentiometry (ISE), immunoturbidimetry, latex-enhanced immunoturbidimetry/— 3 Na ⁺ , K ⁺ , CL ⁻ no/50 to 2,205 no 30 60 —/60 27/71 to 1,053 8 hr/30 days/yes (8°C to 15°C) yes yes yes —/—/— —/40/— liquid no/45 yes/5 years 2 µL no/no yes/7.5 L daily 60 yes/20 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, UPC, Codabar, codes 39 & 128)/yes yes — yes yes/yes/no yes yes/yes yes/yes yes/yes yes no/yes daily/28 days/7 days/— no/yes	immunoassay/quantitative lateral flow immunochromatographic assay none no/— no 1 50 0/— 1/— na/—/no no no no —/—/— test performed immediately dry no no/— na yes/no no/— na no/— no/no yes/yes yes — na —/yes/— — —/— no/no —/— yes na/na —/once per reagent lot—automatic/—/— yes/no
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Album., direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	—, 270 specimens —, 315 specimens —, 180 specimens 60 sec shortest: daily; longest: at customer discretion/yes yes/yes yes	na na na — per local requirements/yes yes/na yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	onboard/no — yes (host query) yes yes no —	no/no Telcor, Aegis POC no yes yes — —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	— no	no no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	no/yes/yes within 24 hr/yes —/— daily: 5 min; weekly: 15 min no/no 3 days on site/yes —	no/—/— na/yes —/overnight replacement na no/— 1 day on site/no na
Distinguishing features (supplied by company)	comprehensive clinical & research test menu, benchtop, low water consumption, automatic start, multi-speed mixing, Windows software *Contact company for complete list	two levels of control performed with every test; Ramp ratio corrects for variability inherent in other lateral flow systems

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 9 of 10	Roche Diagnostics Corp. Todd Atkinson todd.atkinson@roche.com 9115 Hague Rd. Indianapolis, IN 46256 317-521-4564 www.roche.com	SDI Biomed Inc. Robert Silverberg rs@sdiomed.com 23679 Calabasas Road, #241 Calabasas, CA, 91302 818-349-4464 www.sdiomed.com
See accompanying article on page 25		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	Cobas Integra 400 Plus/1999 \$175,000/— >2,000/2,000 Switzerland/Switzerland/U.S. & Germany continuous random access/self-contained multi-use cassettes	SDI CA 480 Clinical Chemistry System/2004 \$85,000/30 >50/>600 Europe/Europe/United States random access/self-contained single-use cartridges/ packages/slides
Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	rack/benchtop 30 x 53 x 26/9.6 sq ft	wheel, with 4 independent segments/benchtop 40.5 x 25.4 x 17.7/7.2 sq. ft.
Tests available on instrument in U.S.	* α -1-acid glycoprot., α -1-antitryp., apo A1 & B, antistrepto.-O, comp. C3c & C4, cerul., CRP latex, CRP(hs), hapt., IgA/G/M, myo., prealb., RF, transferr., amph., barb., benz., coca., ethanol, LSD, meth., methaqa., opia., PCP, PPX, S barb., S benz., THC, ACP, ALP, ALT, α -amy. pancreatic, AP, AST, cholinest., CK-MB, γ -glutamyltrans., LDH, lipase, alb., bil direct & total, Ca., chol., CO ₂ , creat. jaffe, creat. enzy., fructosam., gluc., HbA1c, HDL direct, iron, lact., LDL direct, Mg, ammon., phos., TP, TPU-C, trig., UA, UIBC, urea, Na, K, Cl, Li, acet., amik., carb., dig., gent., lido., NAPA, pheno., pheny., prim., proc., quin., sal., theo., tobra., valp. acid, vanc., T4, T-up, D-dimer, others	albumin, alkaline phosphatase, ALT, amylase, AST, CO ₂ , direct bilirubin, total bilirubin, calcium, cholesterol, CK, creatinine, Gamma-GT, glucose-HK, D-HDL, iron, phosphorus, LDH-L, magnesium, total protein, triglycerides, urea nitrogen, uric acid, D-LDL, UCRP WR, fructosamine, ferritin, HbA1c
Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	none none lipoprotein A none/MPA, tacrolimus, sirolimus —	none none na none/drugs of abuse none
Methods supported/Immunoassay methods	photometry, potentiometry, fluorescence polarization/turbidimetric, latex particle enhanced	photometry, potentiometry/selected methodologies
No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run	4 no/1 no	3 no/— no
No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set	36 tests plus applications for urine & CSF up to 999 0/0 36/50–800 tests, cassettes	30 30 0/available on request 30/150 per container
Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/ Therapeutic drugs/Special analytes	2 weeks/8 to 12 weeks/yes (12°C) yes yes no —/—/—	14 days/30 days/yes (14°C) yes yes yes —/—/—
Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reagent for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/ Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	176/90/1,808 liquid yes/1,500 no/na 1 μ L no/no no/2 L maximum — —/— yes/no yes (2 of 5 interleaved, Codabar, codes 39 & 128)/yes yes — yes yes/yes/yes — no/no yes/yes yes/yes yes yes/yes 5 hr/once per lot/each lot & 12 weeks/each lot & 12 weeks yes/yes	165/40/33 liquid no yes/analyzer uses permanent quartz cuvettes 3 μ L yes/no no/1 L na no/— yes/no yes/yes yes yes yes/yes/no yes no/no yes/yes yes/no yes yes/yes 30 minutes/once per week/once per week/once per week no/no
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Album., direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	369 tests 369 tests 250 tests none 24 hr/yes yes/yes yes	1.5 min., 60 6 min. 48 sec, 60 7 min. 12 sec, 50 3 min. 8 hrs/yes yes/yes yes
Data mgmt. capability/Instrument vendor supplies LIS interface Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	onboard/yes (add'l cost) all major LIS vendors yes (broadcast download & host query) yes yes — —	onboard/— Schylab, LabDaq, Fletcher Flora, Medcom yes yes yes no —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	yes —	no no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	yes/yes/yes —/yes —/— daily: none; weekly: 5 min; monthly: none yes (includes audit trail of who replaced parts)/yes 5 days at vendor offices/yes —	yes/yes/yes yes, guaranteed within 24 hours/yes 10,000 hours/2 hours daily: 5 min.; weekly: 15 min.; monthly: 15 min. yes/no 4 days on site or 4 days at vendor offices/yes \$7,500
Distinguishing features (supplied by company)	unique reagent cassette eliminates reagent preparation; menu consolidates testing, including direct LDL, whole blood, HbA1c, and lithium	permanent cuvettes, onboard jet wash/dry system, six minutes to first result, notebook-like operator interface, small footprint

*Contact company for complete list

Chemistry analyzers (for low-volume laboratories)

SURVEY OF INSTRUMENTS

Part 10 of 10	Thermo Fisher Scientific Bola Nicholson bola.nicholson@thermofisher.com 171 Industry Drive Pittsburgh, PA 15275 800-558-9115 www.thermofisher.com	Vital Diagnostics 27 Wellington Road Lincoln, RI 02865 800-345-2822 www.vitaldiagnostics.com
See accompanying article on page 25		
Name of instrument/First year sold in U.S. List price/No. of analyzers sold in 2006 No. units in clinical use in U.S./Outside U.S. Country where designed/Manufactured/Where reagents manufactured Operational type/Reagent type	Data Pro PLUS/2005 \$45,800/2 4/995 Argentina/Argentina/Australia batch, random access, discrete, continuous random access/self-contained multi-use cartridges-packages-slides, open reagent system	Vitalab Selectra E/— —/— 7/5,000 Netherlands/Netherlands/U.S. random access/self-contained multi-use cartridges/packages/slides
Sample handling system/Model type Dimensions in inches (H x W x D)/Instrument footprint	ring/benchtop 33.5 x 18.5 x 22.8/51.63 sq ft	rotor/benchtop 19 x 45 x 22/8 sq ft
Tests available on instrument in U.S.	alb., alk. phos., amy., AST, BUN, Ca., chloride, chol., CK, CO ₂ , crea., direct bilirubin, GGT, glucose (HK), HDL, iron, LDH, Mg, phosphorus, total bilirubin, total protein, triglycerides, uric acid	ALT, alkaline phosphatase, albumin, amylase, aspartate transaminase, bilirubin direct & total, calcium, CO ₂ , chloride, cholesterol, CPK, creatinine, digoxin, direct HDL & LDL, GGT, glucose, total iron, LDL, magnesium, phenobarbital, phenytoin, phosphorus, potassium, total protein, sodium, theophylline, triglycerides, BUN, uric acid, HbA1c
Tests cleared but not clinically released Tests not available in U.S. but submitted for FDA 510(k) clearance Tests not available in U.S. but available in other countries Research-use-only assays/Tests in development User-defined methods implemented for what analytes	— ISE: Na, K, Cl — —/— none	— — — none/hsCRP —
Methods supported/Immunoassay methods No. of direct ion selective electrode channels • Must load separate reagent pack for each specimen/No. of diff. assays in pack • Separate reagent pack for each test run No. of different measured assays onboard simultaneously No. of different assays programmed, calibrated at once No. of user-definable (open) channels/No. active simultaneously No. of different analytes for which system accommodates reagent containers onboard at once/Tests per container set Shortest/Median onboard reagent stability/Refrigerated onboard Multiple reagent configurations supported Reagent container placed directly on system for use Instrument has same capabilities when 3rd-party reagent used Reagent only cost per reportable result for standard chemistries/ Therapeutic drugs/Special analytes Walkaway capacity in minutes/No. of specimens/No. of tests-assays System is liquid, dry, or reconstituted onboard Uses disposable cuvettes/Max. No. stored Uses washable cuvettes/Replacement frequency Minimum sample volume aspirated precisely at one time Supplied with UPS (backup power)/Requires floor drain Requires dedicated water system/Water consumption in L per hour Noise generated in decibels Dedicated pediatric sample cup/Dead volume Primary tube sampling/Pierces caps on primary tubes Sample bar-code reading capability/Autodiscrimination	photometry, turbidimetry/— 3 no/na no 48 48 12/12 48/225 —/—/yes yes yes yes —/—/— —/48/48 liquid yes/80 yes/once a week 3 µL no/no no/0.58 L — yes/100 µL yes/no yes, on sample transport, shortly before sample is aspirated (2 of 5 interleaved, Codabar, codes 39 & 128)/— yes — yes yes/yes/no yes no/no yes/yes yes/no no no/yes 24 hr/lot change/—/— no/no	photometry, potentiometry (ISE)/immunoturbidimetric 4 no no 26 — 6/26 31/— 72 hr/7 days/yes (12°C below ambient) yes yes yes —/—/— 120/50/approximately 1,500 liquid no/— yes/approximately 10,000 tests 1 µL yes/no no/approximately 0.5 L — yes/20 µL yes/no yes, by handheld scanner as tubes are loaded onto instrument (2 of 5 interleaved, UPC, Codabar, codes 39 & 128)/— no yes yes yes/yes/yes — no/no yes/yes yes/no yes yes/— 4 hr/7 days/—/— yes/yes
Reagent bar-code reading capability Bar-code placement per CLSI standard Auto2A Onboard test auto inventory (determines volume in container) Measures No. of tests remaining/Short sample detection/Clot detection Automatic detection of adequate reagent for aspir. & analysis Hemolysis/Turbidity detection-quantitation Dilution of patient samples onboard/Automatic rerun capability Sample volume can be reduced to rerun out-of-linear-range high results/ Increased to rerun out-of-linear-range low results Autocalibration or autocalibration alert Calibrants stored onboard/Multipoint calibration supported Typical calib. frequency for ISE/Metabolites/Ther. drugs/Drugs of abuse Automatic shutdown/Startup programmable	yes — yes yes/yes/no yes no/no yes/yes yes/no no no/yes 24 hr/lot change/—/— no/no	no yes yes yes/yes/yes — no/no yes/yes yes/no yes yes/— 4 hr/7 days/—/— yes/yes
Stat time to completion of all analytes, throughput per hr. for: • Sodium, potassium, chloride, TCO ₂ • Sodium, potassium, chloride, TCO ₂ , glucose, urea, creatinine • Albumin, direct & total bili., AST, ALT, ALP Typical time delay from ordering stat test to aspir. of sample How often QC required/Onboard SW capability to review QC	210 samples per hour — — less than 60 sec daily/yes	8 min, — 10 min, — 10 min, — 6 min 4 hr/daily
Onboard real-time QC/Support multiple QC lot Nos. per analyte QC results transferred automatically to LIS	yes/yes yes	yes/yes —
Data mgmt. capability/Instrument vendor supplies LIS interface	onboard/no	optional add-on/yes (add'l cost)
Lab information systems with which interfaces are currently up and running in active user sites Bidirectional interface capability Test results transmitted to LIS as soon as chem. time complete LIS interface operates simultaneously with running assays Uses LOINC to transmit orders & results How labs get LOINC codes for reagent kits	Antek yes (host query) no yes — —	— yes yes yes — —
Lab can control analyzer remotely Interface avail. (or will be) to automated specimen handling system	no no	no no
Modem servicing available/Can diagnose own malfunctions/ Determine malfunctioning component On-site time of svc. engineer/Onboard error codes for troubleshooting Mean time between failures/To repair failures Average time to complete maintenance by lab personnel Onboard maintenance records/Maint. training demo module Training provided with purchase/Advanced oper. training avail. Annual service contract cost (24 h/7 d)	no/yes/yes —/yes —/— daily: 5 min; weekly: 15 min; monthly: 30 min yes/no 3 days on site, 5 days at vendor offices/no —	no/yes/yes within 24 hr/yes 6 months/4 hr daily: 10 min; weekly: 20 min; monthly: 60 min no/yes 5 days on site/yes na
Distinguishing features (supplied by company)	open system; compact benchtop; user-friendly Windows software	reusable cuvette; dry ISE with CO ₂ ; 2 to 30 µL sample size; onboard wash system; ready-to-use liquid reagents