Hematology analyzers

Part 1 of 13	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	**CELL-DYN Ruby*** 2006/2006/— >250/>400/$185,000

Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso)*:
  • **Laboratory**
  • **Flags**
	standard menu (left) plus: MPV, RDW, RETIC #&%
	
	#&% for bands, IG, blast, var lymph
	NRBC, FWBC, NWBC, RRBC, band, IG, blast, variant lymph, RBC morph., DFLT, MCHC, LRI, URI, LURI, ATYPDEP, high/low interp. message, WBC

FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none none none
Tests unique to analyzer	atypical depolarization flag

Differential method(s) used	MAPSS (Multi-Angle Polarized Scatter Separation)

Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)
  • Hemoglobin (g/dL)/platelet (10^9/L)
  • MCV (fL) or Hct (%)
Precision: • WBC count/RBC count
  • Hemoglobin/platelet
  • MCV or Hct
	$0.00–246 \times 10^3$/µL/$0.00–7.50 \times 10^6$/µL
	0.00–25.0 g/dL/$0.00–3,000 \times 10^3$/µL
	58–139 fL: (MCV)
	2.4%/1.8%
	1.4%/3.8%
	0.8% (MCV)

Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.983, slope=0.97, y=-1.98; lymph r=0.921, slope=0.95, y=0.94; mono r=0.711, slope=1.10, y=1.93; eos r=0.952, slope=1.04, y=0.01; baso r=0.146, slope=0.18, y=1.22

Interfering substances: • WBC
 	
  • RBC
 	
  • MCV or Hct
 	
  • Platelet
 	
  • Hemoglobin
 	
Interfering substances: differential
	fragile WBC, neutrophil aggregates, lytic-resistant RBC, NRBC, Plt clumps, cryofibrinogen, cryoglobulin
	elevated WBC, increased numbers of giant Plt, autoagglutination, in vitro hemolysis
	MCV: elevated WBC, hyperglyc., in vitro hemolysis, increased No. of giant Plts
	WBC fragments, in vitro hemolysis, microcytic RBC, cryofibrinogen, cryoglobulins, Plt clumping, increased No. of giant Plt
	elevated WBC, increased plasma substances (triglycerides, bilirubin, in vivo hemolysis), lytic-resistant RBC
	fragile WBC, neutrophil aggregates, lytic-resistant RBC, NRBC, Plt clumps, cryofibrinogen, cryoglobulin, paraproteins

Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes up to 84/up to 84 6 months verification
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	open or closed/WBC, RBC, Hgb, MCV, Plt per local regulatory requirements/— 150 µL/230 µL/1.2 mL yes (13×75 mm) no no no —/$125,000

Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results–No. specimens Memory capacity—histo/cytograms–No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen and/or result info. displayed	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes no yes user or vendor — yes yes yes

LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	LIS1/LIS2 CLSI numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast; host query for patient demographics and orders no — yes enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	— Codabar, codes 39 and 128, interl. 2 of 5, ISBT yes

Time required for maintenance by lab personnel	daily: 30 sec; weekly: 5 min; monthly: 10 min
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	yes — yes/no yes

Acquisition program based on cost-per-reportable result	yes

Distinguishing features	touch-sensitive screen, all optical technology; onboard maintenance videos; lyse-resistant RBC mode; rules-based result annotations *please see the corresponding operator's manual for product labeling, including warnings, limitations, and precautions

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

Survey Editor: Raymond Aller, MD

Hematology analyzers

Part 2 of 13	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com	Abbott Hematology Karen Semiao karen.semiao@abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 408-567-3384 www.abbottdiagnostics.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	**CELL-DYN Sapphire*** 2005/2005/— >150/>400/$250,000	**CELL-DYN Emerald*** 2009/2008/0 >250/>150/$30,000
Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):* • Laboratory • Flags	standard menu (left) plus: MPV, RDW, retic %&#, IRF, NRBC %&#, CD61, CD3T %&#, CD4T %&#, CD8T %&#, 4/8 — band, IG, blast, variant lymph, nvWBC, rstRBC, IR, Plt clmp, ASYM, FP, CD61 agg., clot detected during aspiration, short sample	WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, lymph %&#, gran %&#, mid %&#, RDW, MPV — dispersional data alerts, suspect measurand flags and count invalidation flags
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only Tests unique to analyzer	none none optical RBC morphology none CD61 for Plts, CD3/4, CD3/8 (immuno T-cell)	none — none none none
Differential method(s) used Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L) • Hemoglobin (g/dL)/platelet (10^9/L) • MCV (fL) or Hct (%) Precision: • WBC count/RBC count • Hemoglobin/platelet • MCV or Hct Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	MAPSS (Multi-Angle Polarized Scatter Separation) + three-color fluorescence 0.4–250.0 × 10^3 µL/ 0.22–7.50 × 10^6 µL 1.0–24.8 g/dL (cyanide free)/11.0–2,000.0 × 10^3 µL 37.0–179 fL (MCV) ≤2.7%/≤1.5% ≤1.0%/≤4.0% ≤1.0% (MCV) neut% r=0.942 slope 0.947 y=0.446; lym% r=0.936 slope=0.943 y=2.811; mono% r=0.623 slope=1.057 y=0.851; eos% r=0.446 slope=1.024 y=0.288; baso% r=0.232 slope=0.257 y=0.350	impedance counting 0.4–96.1 K/µL/0.22–7.61 M/µL 3.3–24.6 g/dL/9–1,375 K/uL 5.3–75.6% (Hct)/48.8–115 fL (MCV) 3.5% (95% confidence limit)/2.0% (95% confidence limit) 2.1% (95% confidence limit)/6.1% (95% confidence limit) 1.7% Hct (95% confidence limit)/0.8% MCV (95% confidence limit) —/—
Interfering substances: • WBC	Plt clumps, neut aggregates, HbC crystals, lyse-resist. RBCs, cryoglob., cryofibr., frag. WBC, nRBC	cryoglobulin, cryofibrinogen, heparin, monoclonal proteins, nucleated red cells, platelet clumping, unlysed red cells, clotting, smudge cells, uremia plus immunosuppressants
• RBC	autoagg., cold agg., elevated WBC, giant Plts, hemolysis, sm WBC	cryoglobulin, cryofibrinogen, giant platelets, high white cell count (>50,000 K/µL), autoagglutination, clotting, hemolysis (in vitro), microcytic red cells
• MCV or Hct	MCV: autoagg., cold agg., elevated WBC, giant Plt, hemolysis, hyperglycemia	cryoglobulin, cryofibrinogen, giant platelets, high white cell count (>50,000 K/µL) hyperglycemia (>600 mg/dL), autoagglutination, clotting, Hemolysis (in vitro), microcytic red cells, reduced red cell deformability, swollen red cells
• Platelet	auto & cold agg., cryoglob., cryofibrin., giant Plt, micro RBC, Plt clumps, RBC frag., WBC frag., Plt satellitism	cryoglobulin, cryofibrinogen, hemolysis (in vivo and in vitro), microcytic red cells, red cell inclusions, white cell fragments, clotting, giant platelets, heparin, platelet clumping, platelet satellitosis
• Hemoglobin	lipids>700 mg/dL, WBCs>250 × 10^9/L, bilirubin>33 mg/dL, Hb crystals	carboxyhemoglobin (>10%), cryoglobulin, cryofibrinogen, hemolysis (in vivo) heparin, high white cell count (>50,000 K/µL), hyperbilirubinemia, lipemia, monoclonal proteins
Interfering substances: differential	see WBC	platelet aggregates, NRBCs, giant platelets, cryoglogulins, incomplete lysis of RBC, small lymphocytes, fibrin clots, shift in WBC cell distribution due to EDTA anticoagulant equilibration
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 106/106 6 months verification	yes 60/60 scheduled calibration of the CELL-DYN Emerald must conform to the guidelines established by the regulatory agencies governing the laboratory
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	open-closed single procedure/WBC, RBC, Hb, Plt, MPV per regulatory requirement/— 117 µL/117 µL/0.5 mL, 0.3 mL for 10.25 × 64 mm tubes yes (11.5–13 × 65-75 mm, 10.25 × 64 mm, 8.5 × 66 mm [Sarstedt Monovette]) no yes yes (flags only) —/$125,000	open mode, as system has only one mode/WBC, RBC, HGB, MCV, PLT per regulatory requirement/— 9.8 µL/—/— yes (open mode) no no no —
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results–No. specimens Memory capacity—histo/cytograms–No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen and/or result info. displayed	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes yes yes user or vendor yes yes yes yes	yes no 60,000 results on USB and 1,500 results on internal memory 60,000 results on USB and 1,500 results on internal memory 60,000 results on USB and 1,500 results on internal memory yes yes yes yes no no no no no no yes
LIS interface formats supported Information transferred on LIS interface	ASTM 1394 numeric and flag results, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast; host query for patient demographics and orders	proprietary (instrument or vendor specific) numeric and flag results, instrument to LIS
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	no — yes enhanced QC, data archiving, data collation from multiple instruments, remote viewing	no — no
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube	none Codabar, codes 39 and 128, interl. 2 of 5	— Codabar, codes 39 and 128, interleaved 2 of 5, Chinese post, code 93, EAN8, EAN13, EAN128, IATA, industrial 2 of 5, Italian pharmaceutical, matrix 2 of 5, MSI/Plessey, UK/Plessey, Telepen, TriOptic, S-Code, UPC A, UPC E
Accommodates bar-code placement per CLSI standard Auto2A	yes	yes
Time required for maintenance by lab personnel Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	daily: 30 sec; weekly: 10 min; monthly: 5 min yes — yes/no no	daily: 3 min; monthly: 5 min; bi-annually: 10 min yes dependent upon service contract no/no no
Acquisition program based on cost-per-reportable result	yes	no
Distinguishing features	four optical and three fluorescent detectors provide mult. scatterplot analysis; 2-D optical platelets avoid interferences; fluorescent analysis of reticulocytes, NRBCs, and 3-color monoclonal analysis on routine hematology analyzer; OpenFlow MAb test selections; *please see the corresponding operator's manual for product labeling, including warnings, limitations, and precautions	small: sample size, reagent volumes used, and physical size; reliable: system averages one service call per year; easy to use: system has touchscreen software with intuitive icons and minimal layers; *please see the corresponding operator's manual for product labeling, including warnings, limitations, and precautions

Hematology analyzers

Part 3 of 13	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com	Abbott Hematology David Overcash David.Overcash@Abbott.com 5440 Patrick Henry Dr. Santa Clara, CA 95054 800-933-5535 www.abbottdiagnostics.com
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	CELL-DYN 3700* 1999/1999/— >250/>1,000/$180,000 SL Model, $140,000 CS Model	CELL-DYN 3200* 1997/1997/— >600/>1,000/$165,000

Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV,*
        MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):
        • **Laboratory**
        • **Flags**
 	
FDA-cleared tests but not clinically released
Tests not available but submitted for clearance
Tests in development
For research use only
Tests unique to analyzer
	standard menu (left) plus: RDW, MPV, RETIC #&%, IRF
	
	band, IG, variant lymph, blast, PCT, PDW, NRBC #&% and retic scatter profile
	suspect populations, band, blast, variant lymph, IG, NRBC, RRBC, NWBC, LRI,
	URI, LURI, RBC morph., FWBC, high/low interp. message, WBC
	none
	none
	none
	none
	IRF
		standard menu (left) plus: RDW, MPV
		
		band #&%, IG #&%, variant lymph #&%, blast #&%, PCT, PDW, NRBC #&%
		band, IG, variant lymph, blast, NRBC, NWBC, RRBC, FWBC, RBC morph.,
		high/low interp. message, LRI, URI, LURI, WBC
		none
		none
		none
		atypical depolarization flag outside U.S.
		3-D optical RBC analysis with advanced MCV measurement

Differential method(s) used
Linearity: • **WBC count (10^9/L)/RBC count (10^{12}/L)**
        • **Hemoglobin (g/dL)/platelet (10^9/L)**
        • **MCV (fL) or Hct (%)**
Precision: • **WBC count/RBC count**
        • **Hemoglobin/platelet**
        • **MCV or Hct**
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
Interfering substances: • **WBC**
 	
        • **RBC**
 	
        • **MCV or Hct**
 	
        • **Platelet**
 	
        • **Hemoglobin**
 	
Interfering substances: differential
	MAPSS (Multi-Angle Polarized Scatter Separation)
	0–250 K/µL/0–8 M/µL
	0–24 g/dL/0–2,000 K/µL
	50–200 fL (MCV)
	≤2.5%/≤1.5%
	≤1.2%/≤5.0%
	≤1.0% (MCV)
	neut #&%: ≥0.95, —; lymph #&%: ≥0.94, —; mono #&%: ≥0.86, —;
	eos #&%: ≥0.84, —; baso #&%: ≥0.73, —
	NRBCs (WIC only), lytic-resistant RBCs, Plt clumps, cryoglobulin and
	cryofibrinogen, fragile WBCs
	
	increased No. giant Plts, autoagglutination, in vitro hemolysis
	
	MCV: elevated WBC count, increased No. giant Plts, hyperglycemia, in vitro
	hemolysis
	
	WBC fragments, in vitro hemolysis, microcytic RBCs, cryoglobulin, Plt
	clumps, increased No. giant Plts
	
	increased plasma substances (triglycerides, bilirubin, in vivo hemolysis),
	lyse-resistant RBCs
	
	see WBC
		MAPSS (Multi-Angle Polarized Scatter Separation)
		0–250 K/µL/0–8 M/µL
		0–25 g/dL/0–1,750 K/µL
		34–172 fL (MCV)
		≤2.7%/≤1.5%
		≤1.0%/≤4.0%
		≤1.0% (MCV)
		neut #&%: ≥0.95, —; lymph #&%: ≥0.94, —; mono #&%: ≥0.86, —;
		eos #&%: ≥0.84, —; baso #&%: ≥0.73, —
		NRBCs, lytic-resistant RBCs, Plt clumps, cryoglobulin and cryofibrinogen,
		fragile WBCs
		
		elevated WBC count, increased No. giant Plts, autoagglutination, in vitro
		hemolysis
		
		MCV: elevated WBC count, hyperglycemia, in vitro hemolysis, increased
		No. giant Plts
		
		WBC fragments, in vitro hemolysis, microcytic RBCs, cryoglobulins, Plt
		clumping, increased No. giant Plts
		
		elevated WBC count, incr. plasma substances (triglycerides, bilirubin, in vivo
		hemolysis), lyse-resistant RBCs
		
		see WBC

Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** • **Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for slide prep** **If automatic slidemaker available, No. installed/list price**	yes 90/90 6 months verification open & closed/WBC, RBC, Hb, MCV, Plt as per regulatory requirement/— 130 µL/355 µL/1.0 mL yes (13 × 75 mm) yes yes yes (flags only) —/$125,000	yes 71/71 6 months verification open & closed/WBC, RBC, Hb, MCV, Plt, MPV as per regulatory requirement/— 150 µL/240 µL/1 mL (sample loader) yes no yes yes —/$125,000
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** • **Stored in conjunction with CBC data** • **Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes no yes user or vendor yes yes yes yes	yes yes 10,000 results 10,000 results 10,000 results yes yes yes yes no yes user or vendor yes yes yes yes
LIS interface formats supported **Information transferred on LIS interface** **LOINC codes transmitted with results** **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** • **Software features** **Interface avail. or planned to auto. specimen-handling system** **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no — yes enhanced QC, data archiving, data collation from multiple instruments — Codabar, codes 39 and 128, interl. 2 of 5 yes	proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no — yes enhanced QC, data archiving, data collation from multiple instruments — Codabar, codes 39 and 128, interl. 2 of 5 yes
Time required for maintenance by lab personnel **Onboard maintenance records** **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	daily: 30 sec; bi-weekly: 5 min; monthly: 10 min yes — yes/no —	daily: 30 sec; weekly: 5 min; monthly: 10 min yes — yes/no —
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	MAPSS cell-by-cell analysis; retic. with reportable IRF (immature retic. fraction); up to 60 different animal types may be configured for analysis; *please see the corresponding operator's manual for product labeling, including warnings, limitations, and precautions	MAPSS cell-by-cell analysis provides enhanced diff.; focused flow 2-D optical RBC and Plt analysis provides better separation between microcytic RBCs and large Plts; uses only three reagents; 3-D MCV; *please see the corresponding operator's manual for product labeling, including warnings, limitations, and precautions

Part 4 of 13	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	**UniCel DxH 800** 2008/2008/2 30/20/$219,000 or $229,000 with floor stand	**LH 1500 Hematology Automation Series** 2002/2003/15 >65/25/varies
Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV,* *MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):*	standard menu (left) plus: RDW-CV, RDW-SD, MPV, retic#, retic%, IRF, MRV, NRBC# and %, body fluids–total nucleated count, and RBC count for synovial, serous, and CSF fluids.	standard menu (left) plus: RDW, MPV, retic %&#, IRF, graded RBC morph., NRBC %&#, TNC & RBC on CSF, synovial, and serous fluids
• **Laboratory** • **Flags**	— definitive, suspect and system messages, user-definable extended decision rules, ISLH consensus rules, user-definable differential sensitivity	— user-definable age-, gender-, and/or location-based ref. intervals; action and critical limits; user-def. RBC morph.; user-selectable sensitivity for diff., abnormal population suspect messages
FDA-cleared tests but not clinically released **Tests not available but submitted for clearance** **Tests in development** **For research use only**	— — — high light scatter reticulocytes (HLR% and HLR#), low hemoglobin density (LHD), microcytic anemia factor (MAF), mean sphered cell volume (MSCV), plateletcrit (PCT), platelet distribution width (PDW), reticulocyte distribution width (RDWR-CV and RDWR-SD), red cell size factor (RSF), cell population data research parameters	— — — MSCV, HLR %&#, PDW, PCT, WBC research population data (RPD) LH 780: MAF, RSF, RDWR-SD, RDWR-CV
Tests unique to analyzer		IVD: NRBC, body fluids; RUO: MSCV, WBC RPD
Differential method(s) used	flow cytometric digital analysis using volume, conductivity, and five angles of light scatter, digital signal processing, advanced algorithm applications, high- definition cellular resoluton, DataFusion	Coulter's 3-D VCS biophysical flow cytometry with IntelliKinetics, AccuGate and AccuFlex technologies
Linearity: • **WBC count (10⁹/L)/RBC count (10¹²/L)** • **Hemoglobin (g/dL)/platelet (10⁹/L)** • **MCV (fL) or Hct (%)** **Precision:** • **WBC count/RBC count** • **Hemoglobin/platelet** • **MCV or Hct**	$0–400/0–8.5$ $0–25.5/0–3,000$ $50–150$ $\leq3.0\%/\leq1.5\%$ $\leq1.5\%/ \leq3.5\%$ $\leq1.0\%$	$0–400/0–8.0$ $0–25/0–3,000$ $50–200$ (MCV) $<1.7\%/<0.8\%$ $<0.8\%/<3.3\%$ $<0.8\%$ (MCV)
Accuracy of automated diff. compared with manual diff. **(per CLSI H-20A), regression equation**	NE = ±2.0; LY, MO = ±3.0; EO,BA = ±1.0 (or 10%, whichever is greater), —	lymph% = ±3.0%, —; neut% = ±3.0%, —; mono% = ±2.0%, —; eos% = ±1.0%, —; baso% = ±1.0%, —
Interfering substances: • **WBC**	precipitated elevated proteins, cryoglobulin, fragmented white cells, agglutinated white cells, lyse-resistant red cells, giant platelets, platelet clumps, unlysed particles > 35 fL in size	unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps
• **RBC** • **MCV or Hct** • **Platelet** • **Hemoglobin**	very high WBC count, high concentration of very large platelets, autoagglutination very high WBC count, high concentration of very large platelets, autoagglutination platelet clumps, white cell fragments, very small red cells, red cell fragments severe lipemia, heparin, certain unusual RBC abnormalities that resist lysing	very high WBC, high conc. large Plt, autoagglutinins very high WBC, high conc. large Plt, autoagglutinins very small RBCs & WBC frags. may interfere very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs
Interfering substances: differential	elevated triglycerides, precipitated elevated proteins	high triglycerides may affect lysing
Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** • **Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for** **slide prep** **If automatic slidemaker available, No. installed/list price**	yes >100 per hour/>100 per hour two times per year or per regulatory requirements CBC/RBC, WBC, Hgb, MCV, PLT, MPV per regulatory requirements/daily 165 µL/165 µL/300–400 µL yes (variety of sizes) no yes yes —	yes 105 per analyzer on automation system/105 per analyzer on automation sys. as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 µL/300 µL, 550 µL with slidemaker/1.0 mL yes no yes yes >850 (U.S.)/$110,000
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** • **Stored in conjunction with CBC data** • **Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes yes 40,000 standalone; 120,000 in workcell 40,000 standalone; 120,000 in workcell 40,000 yes yes yes yes yes yes yes some results yes yes yes	yes yes 20,000 samples per instrument 20,000 samples per instrument 20,000 samples per instrument yes yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported **Information transferred on LIS interface**	ASTM 1394 and 1381 numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast; host query for patient demographics and orders (available with release of workcell)	RS-232 numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast
LOINC codes transmitted with results **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** • **Software features**	yes phone or Web support yes, BCI enhanced QC, data archiving, data collation from multiple instruments, user- definable decision rules, ISLH rules, delta check included with DxH; Remisol Advance also available	no contact technical support yes, DL2000, Command Central enhanced QC, data archiving, data collection from multiple instruments, extensive decision rules, delta checking, patient results and graphics
Interface avail. or planned to auto. specimen-handling system **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	Beckman Coulter Codabar, codes 39 and 128, interl. 2 of 5, NW7 yes	Beckman Coulter Codabar, codes 39 and 128, interl. 2 of 5, NW7 yes
Time required for maintenance by lab personnel	daily: 2 min; weekly: as needed; monthly: as needed	daily: automation system= 5 min, analyzer=0 min; weekly: automation=10 min, analyzer=0 min; monthly: automation=15 min, analyzer=2 min
Onboard maintenance records **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	yes varies yes/no yes	yes — yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	integrated automation w/auto repeat/reflex testing based on extended onboard user-defined decision rules; single aspiration pathway negates mode-to-mode comparisons; flow cytometric digital morphology w/five angles of light scatter; separate channel for WBC, NRBC, and retic analysis; digital signal processing, DataFusion; future scalability options include DxH workcells with trackless connectability; intelligent workload distribution; configurable with up to four analyzers; integrated slidemaker/slidestainer; consolidated database	system automatically loads and unloads cassettes, performs reflex and repeat testing, sorts tubes for off-line tests, stores tubes with availability for retrieval for any type of test; multiple configurations available; RUO: WBC research population data

Part 5 of 13	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	**LH 780/LH 785** 2006/2007/160 >460/>475/LH 780: $214,500; LH 785: $389,500	**Coulter LH 750** 2001/2001/250 (U.S.) >2,400/>2,300/$195,000

Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV,*
         MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):
         • Laboratory
         • Flags
	standard menu (left) plus: RDW, RDW-SD, MPV, Retic %&#, IRF, MPV, graded RBC morph., NRBC %&#, TNC & RBC on CSF, synovial, and serous fluids
	—
	user-definable age-, gender-, and/or location-based ref. intervals; action and critical limits, user-def. RBC morph.; user-def. sensitivity for diff. abnormal populations, suspect and definitive messages
		standard menu (left) plus: RDW, MPV, retic #&%, IRF, MPV, graded RBC morph., NRBC %&#, TNC & RBC on CSF, synovial, and serous fluids
		—
		user-definable age-, gender-, and/or location-based ref. intervals; action and critical limits; user-def. RBC morph.; gradient msgs. (=+, ++, +++); user-selectable sensitivity for diff. abnormal population suspect messages

FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	— — — RSF, MAF, MSCV, HLR %&#, RDWR-CV, RDWR-SD, PDW, PCT, WBC research population data (RPD)	— — — MSCV, HLR %&#, PDW, PCT, WBC research population data (RPD)
Tests unique to analyzer	IVD: NRBC, body fluids, RDW-SD; RUO: MSCV, RSF, MAF, WBC RPD	IVD: NRBC, body fluids; RUO: MSCV, WBC RPD
Differential method(s) used	Coulter's 3-D VCS biophysical flow cytometry with Intellikinetics, AccuGate & AccuFlex technologies	Coulter's 3-D VCS biophysical flow cytometry with IntelliKinetics, AccuGate & AccuFlex technologies

Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)
         • Hemoglobin (g/dL)/platelet (10^9/L)
         • MCV (fL) or Hct (%)
Precision: • WBC count/RBC count
         • Hemoglobin/platelet
         • MCV or Hct
	0–400/0–8.0
	0–25/0–3,000
	50–200 (MCV)
	<1.7%/<0.8%
	<0.8%/<3.3%
	<0.8% (MCV)
		0–400/0–8.0
		0–25/0–3,000
		50–200 (MCV)
		<1.7%/<0.8%
		<0.8%/<3.3%
		<0.8% (MCV)

Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	lymph% = ±3.0%, —; neut% = ±3.0%, —; mono% = ±2.0%, —; eos% = ±1.0%, —; baso% = ±1.0%, —	lymph% = ±3.0%, —; neut% = ±3.0%, —; mono% = ±2.0%, —; eos% = ±1.0%, —; baso% = ±1.0%, —
Interfering substances: • WBC	unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps	unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, giant Plt, Plt clumps
• RBC	very high WBC, high conc. large Plt, autoagglutinins	very high WBC, high conc. large Plt, autoagglutinins
• MCV or Hct	very high WBC, high conc. large Plt, autoagglutinins (MCV)	MCV & Hct: very high WBC, high conc. large Plt, autoagglutinins
• Platelet	very small RBCs & WBC frags.	very small RBCs & WBC frags. may interfere
• Hemoglobin	very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs	very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs
Interfering substances: differential	high triglycerides may affect lysing	high triglycerides may affect lysing
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 105/105 as dictated by your lab procedures, local or national regulations	yes 105/105 as dictated by your lab procedures, local or national regulations
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep	primary/RBC, WBC, Hgb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 µL/300 µL (550 µL with slidemaker)/1.0 mL yes no yes yes	primary/RBC, WBC, Hb, MCV, Plt, MPV per CLIA, CAP, JCAHO, state or lab SOP/once per day 200 µL/300 µL, 550 µL with slidemaker/1.0 mL yes (multiple sizes and styles) no yes yes, both
If automatic slidemaker available, No. installed/list price	>50/$110,000	>900 (U.S.)/$110,000
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results–No. specimens Memory capacity—histo/cytograms–No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen and/or result info. displayed	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported Information transferred on LIS interface	proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument—broadcast	RS-232, proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast
LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	no contact technical support yes, DL2000, Command Central enhanced QC, data archiving, data collection from multiple instruments, extensive decision rules, delta checking, patient results and graphics, centralized result management	no technical support yes, DL2000, Command Central enhanced QC, data archiving, common database, extensive decision rules, delta checking, patient results and graphics, centralized management of all instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	Beckman Coulter Codabar, codes 39 and 128, interl. 2 of 5 yes	Beckman Coulter Codabar, codes 39 and 128, interl. 2 of 5, NW7 yes
Time required for maintenance by lab personnel	daily: 0 min; weekly: 0 min; monthly: 2 min	daily: 0 min; weekly: 0 min; monthly: 2 min
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	yes — yes/no yes	yes — yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	extensive onboard user-defined decision support; extended linearity for WBC and Plt using AccuCount technology; enumeration of NRBCs with every differential; random access/automation ready; integrated slidemaker/slidestainer options; proservice; electronic IQAP; expanded QC module; RUO: WBC research population data	extensive decision support; enumeration of NRBCs with every diff.; random access; automation ready; extended linearity for WBC and Plts; RUO: WBC RPD

Part 6 of 13	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com	Beckman Coulter Inc. Mary Beth Johnson mbjohnson@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-3183 www.beckmancoulter.com
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	**Coulter LH 500** 2003/2003/200 (U.S. only) >1,300/>1,700/$145,000	**Coulter HmX** 1999 HmX AL >1,140/>2,200/$135,000

Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV,*
        MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):
        • **Laboratory**
        • **Flags**
	standard menu (left) plus: retic #, retic %, MRV, IRF, RDW, MPV
	
	—
	user-definable age-, gender- and/or location-based ref. intervals, action and critical limits; user-def. RBC morph.; gradient msgs.
		standard menu (left) plus: RDW, MPV, retic #&%, graded RBC morph., IRF, MRV
		
		—
		comprehensive high/low, definitive and suspect messages

FDA-cleared tests but not clinically released **Tests not available but submitted for clearance** **Tests in development** **For research use only**	none none none PCT, PDW	none none none PCT, PDW
Tests unique to analyzer	none	none

Differential method(s) used
 	
Linearity: • **WBC count (10^9/L)/RBC count (10^{12}/L)**
        • **Hemoglobin (g/dL)/platelet (10^9/L)**
        • **MCV (fL) or Hct (%)**
Precision: • **WBC count/RBC count**
        • **Hemoglobin/platelet**
        • **MCV or Hct**
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
 	
Interfering substances: • **WBC**
 	
            • **RBC**
 	
            • **MCV or Hct**
 	
            • **Platelet**
 	
            • **Hemoglobin**
 	
Interfering substances: differential
	Coulter's 3-D biophysical flow cytometry with AccuGate 500, Reaction Manager technologies
	0–200/0–8.0
	0–25/0–2,000
	50–150 (MCV)
	2.5%/≤2.0%
	1.5%/≤5.0%
	2% (MCV)
	lymph= ±1.5 % mean diff., —; mono= ±1.5 % mean diff., —; neut= ±2.0% mean diff., —; eos= ±0.5 % mean diff., —; baso= ±0.5 % mean diff., —
	
	lyse-resistant, nucleated RBCs, frag. WBCs, agglut. WBCs, unlysed particles >35 fL, very large or agg. Plts, fibrin, cell frag., or other debris
	very high WBC count, many very large Plts, agglut. RBCs, RBCs <36 fL, fibrin, cell fragments, or other debris
	MCV: very high WBC count, high concentration of very large Plts, agglut. RBCs, RBC fragments <36 fL, rigid RBCs
	very small red cells near the upper threshold, cell fragments, clumped Plts, Plt frag. or cellular debris near the lower Plt threshold, giant Plts, Plt clumps, red & white cell frag., electronic noise, very small red cells
	very high WBC count, severe lipemia, heparin, lyse-resistant RBCs, turbidity such as elevated triglycerides
	factors that affect WBC count above or high triglycerides that affect lysing, hypogran. granulocytes, agranul. granulocytes, lyse-resist. red cells, very small or multi-population lymphocytes, elevat. trigly., precipitated elev. proteins
		Coulter's 3-D VCS technology
		
		0–99.9/0–7.0
		0–25/0–999
		50–150 (MCV)
		<2.5%/<2.0%
		<1.5%/<5.0%
		<2.0% (MCV)
		lymph%= ±3.0%, —; mono%= ±2.0%, —; neut%= ±3.0%, —; eos%= ±1.0%, —; baso%= ±1.0%, —
		
		unusual RBC abnormalities that resist lysing, NRBC, frag. WBC, unlysed particle >35 fL, large Plt
		very high WBC, high conc. of very large Plt, autoagglutinins
		
		MCV & Hct: very high WBC, high conc. of large Plt, autoagglutinins
		
		very small RBCs & WBC frags. may cause no fit
		
		very high WBC, severe lipemia, heparin, rare lyse-resistant RBCs
		
		high triglycerides may affect lysing

Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** **• Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for slide prep** **If automatic slidemaker available, No. installed/list price**	yes 75/75 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV not specified/once per day 125 µL/185 µL/tube dependent yes (10.25 × 75 mm or less; 13 × 75 mm or less) no yes no —	gender-specific printout 75/75 as dictated by your lab procedures, local or national regulations primary/RBC, WBC, Hb, MCV, Plt, MPV not specified/once per day 125 µL/185 µL/50 µL predilute/0.5 mL yes (multiple sizes and styles) no yes no —
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** **• Stored in conjunction with CBC data** **• Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes yes 20,000 samples 20,000 samples 20,000 samples yes yes yes yes yes yes user yes yes yes yes	yes yes 5,000 samples 5,000 samples 5,000 samples yes yes yes yes no yes user or vendor yes, through a selective batch process 4 colors/cell types colors without thresholds no
LIS interface formats supported **Information transferred on LIS interface** **LOINC codes transmitted with results** **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** **• Software features** **Interface avail. or planned to auto. specimen-handling system** **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	RS-232, proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000, Command Central enhanced QC, data archiving, data collation from multiple instruments, common database, extensive decision rules, delta checking, patient results & graphics, centralized management of instruments — Codabar, codes 39 and 128, ASTM, interl. 2 of 5, NW7 yes	RS-232, proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000 enhanced QC, data archiving, common database, delta checking, patient results and graphics — Codabar, codes 39 and 128, interl. 2 of 5, NW7 no
Time required for maintenance by lab personnel	none	none
Onboard maintenance records **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	yes — yes/no yes	no — yes/no no
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	extensive decision support, extended linearity for WBC & Plt, low review rate, small footprint, superior reliability, ProService, electronic IQAP	VCS technology; low review rate; no routine daily maintenance; triplicate counting; aperture burn circuit; sweepflow; SmartStart system; autoloader and single-sample models

Hematology analyzers

Part 7 of 13	Beckman Coulter Inc. Kelly Colwell KMColwell@beckman.com 250 So. Kraemer Blvd Brea, CA 92821 714-961-4110 www.beckmancoulter.com	Horiba Medical Jim Knowles jknowles@horiba.com 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.horiba.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	Coulter Ac•T 5diff Family; Ac•T 5diff AL 2001/2000; 2003/2003; cap pierce: not applicable, autoloader: not applicable 900/3,000/$43,500 cap-pierce model; 300/750/$54,500 autoloader model	Pentra 60C+ Hematology Analyzer 2000/2000/85 510/1,038/$45,476

Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV,*
      MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):
      • Laboratory
 	
      • Flags
	standard menu (left) plus: RDW, MPV
	
	atyp. lymph. # (ATL#), atyp. lymph % (ATL%), immature cells # (IMM#),
	immature cells % (IMM%), PCT, PDW
	complete operator selectable flagging
		standard menu (left) plus: RDW, MPV
		
		atyp. lymph, atyp. lymph %, LIC, LIC %
		
		operator selectable flagging

FDA-cleared tests but not clinically released **Tests not available but submitted for clearance** **Tests in development** **For research use only** **Tests unique to analyzer**	none none none PCT, PDW, IMM, ATL none	none none none PCT PDW none

Differential method(s) used
 	
Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)
      • Hemoglobin (g/dL)/platelet (10^9/L)
      • MCV (fL) or Hct (%)
Precision: • WBC count/RBC count
      • Hemoglobin/platelet
      • MCV or Hct
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
 	
Interfering substances: • WBC
 	
      • RBC
 	
      • MCV or Hct
 	
      • Platelet
 	
      • Hemoglobin
 	
Interfering substances: differential
	A^{c}V technology combining cytochemistry, focused flow impedance, and
	light absorbance prinicples of measurement
	0.4–91.3/0.3–8.0*; AL: 0.4–120.0/0.3–8.0
	0–22/10–1,000*; AL: 1.3–24.0/10.0–1,000
	1.8–63.8 (Hct)*
	<2%/<2%
	<1%/<5%
	<1.0% (Hct); AL: <2.0% (Hct)
	not available in NCCLS H-20A format
	
	NRBCs, Plt clumps, large Plts, lyse-resistant RBCs
	
	cold agglutinins, Plt clumps, WBC overlinearity
	
	Hct: lipemic samples, high WBC, cold aggluts
	
	RBC and WBC fragments
	
	elevated WBC, lipemia
	
	lyse-resistant RBCs, NRBCs, lipemia
		DHSS technology combining cytochemistry, focused flow impedance, and light
		absorbance principles of measurement
		0–120/0–8
		0.7–24/0–1,900
		0.7–67 (Hct)
		<2%/<2%
		<1%/<5%
		<2% (Hct)
		neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.96, —; eos% r=0.89, —;
		baso% r=0.54, —
		
		NRBCs, Plt clumps, lyse-resistant RBCs
		
		cold agglutinins
		
		Hct: extreme leukocytosis
		
		microcytes, Plt clumps
		
		extreme lipemia/leukocytosis
		
		NRBC, lyse-resistant RBCs, extreme hyperbilirubinemia

Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** **• Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for** **slide prep** **If automatic slidemaker available, No. installed/list price**	yes 60/60; 80/80 not specified by time open or closed/RBC, WBC, Hb, Hct, Plt not specified/none 30 µL for CBC/30 µL/varies by tube size; 53 µL for CBC-diff./53 µL for CBC-diff./varies by tube size yes (multiple sizes) no yes no —	yes 60/60 6 months closed-open/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 30 µL for CBC & 53 µL for CBC + diff./30 µL for CBC & 53 µL for CBC + diff./— yes (multiple sizes) yes yes yes —
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** **• Stored in conjunction with CBC data** **• Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes no yes user or vendor yes, through user-defined criteria no yes yes	yes yes, with back-up drive unlimited with back-up drive 10,000, unlimited with back-up drive 10,000, unlimited with back-up drive yes yes yes yes yes yes user yes yes yes yes
LIS interface formats supported **Information transferred on LIS interface** **LOINC codes transmitted with results** **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** **• Software features** **Interface avail. or planned to auto. specimen-handling system** **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	proprietary; proprietary ASTM numeric and flag results, histograms and diff. plots, instrument to LIS; patient demographics, orders, LIS to instrument—broadcast no technical support yes, DL2000, Command Central enhanced QC, data archiving, common database, optional data mgmt., extensive decision rules, delta checking, patient results and graphics available, centralized management of all instruments no Codabar, codes 39 and 128, interl. 2 of 5, EAN 8 and 13 yes	ASTM 1394 and 1238, HL7, IEEE MIB numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, LIS to instrument—broadcast yes — yes (MultiLink) enhanced QC, data archiving with Data Manager no Codabar, codes 39 and 128, ASTM, interl. 2 of 5 yes
Time required for maintenance by lab personnel **Onboard maintenance records** **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	none yes — yes/no no	weekly: 15 min yes 24 hrs yes/yes yes, with Data Manager
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	quant. five-part WBC diff.; aspirates only 30 µL of sample; requires small space footprint and runs quietly; AL has auto repeat based on decision rules *** linearity stated for Ac•T 5diff CP**	reliable five-part WBC diff. technology—MTBF more than 200 days; small footprint; small sample size of 53 µL

Hematology analyzers

Part 8 of 13	Horiba Medical Jim Knowles jknowles@horiba.com 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.horiba.com	Horiba Medical Jim Knowles jknowles@horiba.com 34 Bunsen Irvine, CA 92618 888-903-5001 ext. 553 www.horiba.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	**Pentra XL 80** 2004/2003/31 186/510/$73,826	**Pentra DX120** 2005/2004/6 36/648/$199,500

Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV,*
MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):
        • Laboratory
 	
        • Flags
	standard menu (left) plus: automatic dilution of overrange results
	(WBC × 3, RBC/hgb/Plt × 2), RDW, MPV
	atyp. lymph, atyp. lymph%, LIC, LIC%
	
	operator selectable flagging
		standard menu (left) plus: NRBCs, reticulocytes, IRF, MRV
		
		LIC%&#, atyp lymphs %&#, IMG %&#, IML %&#, IMM %&#, RETL%, RETM%,
		RETH%, IMR%, MRU, MFI%, CRC%
		—

FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none none PCT PDW	none none none PCT PDW, IMG, IML, IMM
Tests unique to analyzer	automatic dilution protocol	—

Differential method(s) used
 	
Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)
        • Hemoglobin (g/dL)/platelet (10^9/L)
        • MCV (fL) or Hct (%)
Precision: • WBC count/RBC count
        • Hemoglobin/platelet
        • MCV or Hct
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
	DHSS technology combining cytochemistry, focused flow impedance and light
	absorbance
	0–120/0–8
	0–24/0–1,900 (>2 g/dL Hb)
	0–67 (Hct)/0–2,800 (<2 g/dL Hb)
	<2%/<2%
	<1%/<5%
	<2% (Hct)
	neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.96, —; eos% r=0.89, —;
	baso% r=0.54, —
		cytochemistry (chlorazol black E) and absorbance
		
		0–150/0.5–8.1
		2–25/0–2,000
		0–80 (Hct)
		<2%/<2%
		<1%/<5%
		<2% (Hct)
		neut% r=0.99, —; lymph% r=0.98, —; mono% r=0.92, —; eos% r=0.97, —;
		baso% r=0.71, —

Interfering substances: • WBC
 	
        • RBC
 	
        • MCV or Hct
 	
        • Platelet
 	
        • Hemoglobin
	NRBCs, Plt clumps, lyse-resistant RBCs
	
	cold agglutinins
	
	Hct: extreme leukocytosis
	
	microcytes, Plt clumps
	
	extreme lipemia, leukocytosis
		NRBCs, Plt clumps, lyse-resistant RBCs
		
		cold agglutinins
		
		Hct: extreme leukocytosis
		
		microcytes, Plt clumps
		
		extreme lipemia, leukocytosis

Interfering substances: differential	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia	NRBCs, lyse-resistant RBCs, extreme hyperbilirubinemia
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib.	yes 80/80 6 months	yes 120/120 6 months
• Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	open, closed/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 30 µL for CBC/53 µL for CBC + diff./0.5 mL	open, closed/WBC, RBC, Hb, Hct, Plt, MPV per CLIA standards/none 130 µL/200 µL/1 mL
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	yes (autoloader 13 × 75 mm; closed tube 16 sizes + micro) yes yes yes —/—	yes yes yes, open mode yes —/—
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results–No. specimens Memory capacity—histo/cytograms–No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen and/or result info. displayed	yes yes, with MultiLink Data Manager MultiLink Data Manager; 10,000 instrument only MultiLink Data Manager; 10,000 instrument only MultiLink Data Manager yes yes yes yes yes yes user yes yes yes —	yes yes unlimited Data Manager; 10,000 instrument only unlimited Data Manager unlimited Data Manager yes yes yes yes yes yes user — yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features	proprietary, ASTM 1394 and 1238, HL7, IEEE MIB numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast — — yes (MultiLink) enhanced QC, data archiving, data collation from multiple instruments	proprietary, ASTM 1394 and 1238, HL7, IEEE MIB numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast — — yes (MultiLink) enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	yes Codabar, codes 39 and 128, ASTM, interl. 2 of 5 yes	yes Codabar, codes 39 and 128, ASTM, interl. 2 of 5 yes
Time required for maintenance by lab personnel	weekly: 15 min	weekly: 15 min
Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	yes 24 hrs no/yes yes	yes — no/yes yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	compact five-part differential instrument with autoloader and autodilution capability, autorerun feature, autovalidation	high-throughput cell counter with integrated reticulocyte methodology and slidemaker/stainer; fluorescent NRBC counting, auto rerun and reflex testing, autovalidation

Part 9 of 13	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 http://www.usa.siemens.com/diagnostics	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 http://www.usa.siemens.com/diagnostics
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	**Advia 120 Hematology System** 1998/1998/— >750/3,500/$169,000–$189,000	**Advia 2120 Hematology System** 2004/2004/— >200/>900/$225,000

Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso)*:
   • **Laboratory**
 	
   • **Flags**
 	
FDA-cleared tests but not clinically released
Tests not available but submitted for clearance
Tests in development
For research use only
Tests unique to analyzer
	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic %&#, CHr, CHCMr, MCVr; CSF: WBC, RBC, PMN, MN, neut, lymph, mono; cellular Hgb %: hypo, hyper, macro, micro; calc. Hb, MPXI; %: blasts, PMN, MN; large Plt count; RBC frag. count; RBC ghost count
	left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hb variation, hypo, hyper, NRBC, RBC frag., RBC ghost, large Plt, Plt clumps
	none
	none
	IRF, MPC, MPM
	CSF, eos
	CHCM, HDW, CHr, CHCMr, MPC, MPM; CSF: WBC RBC, MN, PMN, neut, lymph, mono
		standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic %&#, CHr, CHCMr, cellular Hgb, MCVr; CSF: WBC, RBC, PMN, MN, neut, lymph, mono % hypo, hyper, macro, micro; MPXI, %: blast, PMN, MN, large Plt count, RBC fragment count; RBC ghost count, NRBC
		left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hb variation, hypo, hyper, NRBC, RBC frag., RBC ghost, large Plt, Plt clumps
		none
		none
		MPC, MPM
		IRF, CSF, eos
		CHCM, HDW, CHr, CHCMr, cellular Hgb, MPC, MPM, CSF: WBC, RBC, PMN, MN, neut, lymph, mono

Differential method(s) used
 	
Linearity: • **WBC count (10^9/L)/RBC count (10^{12}/L)**
   • **Hemoglobin (g/dL)/platelet (10^9/L)**
   • **MCV (fL) or Hct (%)**
Precision: • **WBC count/RBC count**
   • **Hemoglobin/platelet**
   • **MCV or Hct**
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
 	
Interfering substances: • **WBC**
   • **RBC**
   • **MCV or Hct**
   • **Platelet**
   • **Hemoglobin**
 	
Interfering substances: differential
	perox–peroxidase cytochem. staining with light scatter and absorption; baso–cytochem. stripping with 2-angle laser light scatter
	0.02–400/0–7.0; CSF WBC 0–5,000/µL; CSF RBC 0–1,500/µL
	0–22.5 /5–3,500
	30–180 (MCV)
	2.7%/1.2%
	0.93%/2.93%
	0.78% (MCV)
	neut% r=0.997, y=1.02x–0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x–0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92x+0.6
	incomplete RBC lysis (perox only)
	cold agglutinins, extreme sickle cell
	none
	none
	high WBC, lip., extremely high bili., interfere with cyanmethb. only, none with direct cellular Hb (CHCM)
	incomplete lysis of RBCs, complete myeloperox. deficiency
		peroxidase WBC—peroxidase cytochem. staining with light scatter and absorption; baso—cytochem. stripping with 2-angle laser light scatter
		0.02–400; CSF WBC 0–5,000/0–7.0; CSF RBC 0–1,500
		0–22.5/5–3,500
		30–180 (MCV)
		2.7%/1.2%
		0.93%/2.93%
		0.78% (MCV)
		neut% r=0.997, y=1.02x–0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x–0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92x+0.6
		 incomplete RBC lysis (peroxidase only)
		cold agglutinins, extreme sickle cell
		none
		none
		extreme lipemia, high WBC, extreme high bili. interference w/ colorimetric Hb only, none with cellular Hb
		incomplete RBC lysis, complete myeloperox. deficiency

Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** • **Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for slide prep** **If automatic slidemaker available, No. installed/list price**	yes 120/120 6 months open, closed, autosampler/all measured parameters once per shift/not required 157 µL/157 µL/<300 µL (tube size dependent) yes (2, 3, 5, 7 mL—all sizes–open tube) yes yes yes —	yes 120/120 6 months autosampler, closed, open/all measured parameters once per shift/not required 175 µL/175 µL/<300 (tube size dependent) yes (2, 3, 5, 7 mL—all sizes open) yes yes if integrated to Advia Autoslide Advia Autoslide, —/$98,000
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** • **Stored in conjunction with CBC data** • **Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes	yes no 10,000 10,000 10,000 yes yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported **Information transferred on LIS interface** **LOINC codes transmitted with results** **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** • **Software features**	proprietary (Spec 79) numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics and orders no online documentation yes (CentraLink) enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations	proprietary numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, patient orders, LIS to instrument— broadcast; host query for patient demographics and orders (when bar code is read, host is queried for orders) no online documentation yes (CentraLink) enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations
Interface avail. or planned to auto. specimen-handling system **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	LabCell (Siemens) Codabar, codes 39 and 128, ASTM, interl. 2 of 5 yes	LabCell (Siemens) Codabar, codes 39 and 128, interl. 2 of 5 —
Time required for maintenance by lab personnel	daily: 10 min; weekly: 15 min; monthly: 15 min	daily: 0 min; weekly: 15 min; monthly: 15 min
Onboard maintenance records **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	yes territory dependent yes/no yes	yes territory dependent yes/no yes
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	unique laser technology provides cellular Hb for RBCs and retics; 2-D Plt analysis that eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay	unique laser technology provides direct cellular Hb for RBCs and retics; 2-D Plt analysis that eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay

Part 10 of 13	Siemens Healthcare Diagnostics Rita White rita.f.white@siemens.com 500 GBC Drive Newark, DE 19702 888-899-2896 http://www.usa.siemens.com/diagnostics	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	Advia 2120i 2008/2008/— —/—/$225,000	XE-5000 2009/2008/115 155/800/$265,122
Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso):* • Laboratory • Flags	standard menu (left) plus: CHCM, MPV, RDW, HDW, LUC %&#, retic. %&#, CHr, CHCMr, cellular Hgb, MCVr; CSF: WBC, RBC, PMN, MN, neut, lymph, mono %hypo, hyper, macro, micro, MPXI, %blast, PMN, MN, large Plt count, RBC fragment count, RBC ghost count, NRBC left shift, atyp. lymph, blasts, immature grans, myeloperox. deficiency, aniso, micro, macro, Hgb variation, hypo, hyper, NRBC, RBC frag, RBC ghost, large Plt, Plt clumps	standard menu (left) plus: NRBC %&#, Retic %&#, RDW-SD, RDW-CV, IRF, Plt-O, HPC#, MPV, IG%, IG#, RET-He, IPF none Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast, left shift, atyp. lymph., ABN lymph./blast, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity
FDA-cleared tests but not clinically released Tests not available but submitted for clearance Tests in development For research use only	none none MPC, MPM IRF, CSF eos	none none none none
Tests unique to analyzer	CHCM, HDW, CHr, CHCMr, cellular Hgb, MPC, MPM, CSF: WBC, RBC, PMN, MN, neut, lymph, mono	reticulocyte hemoglobin, immature platelet fraction, hematopoietic progenitor cell, immature reticulocyte fraction, reportable immature granulocyte #&%
Differential method(s) used	peroxidase WBC: peroxidase cytochem. staining w/ light scatter and absorption; baso: cytochem. stripping w/ two-angle laser light scatter	fluorescent flow cytometry, RF/DC detection method
Linearity: • WBC count (10⁹/L)/RBC count (10¹²/L)	0.02–400 CSF: 0–5,000/0–7.0 CSF: 0–1,500	0–440/0–8
• Hemoglobin (g/dL)/platelet (10⁹/L)	0–22.5/5–3,500	0–25/0–5,000
• MCV (fL) or Hct (%)	30–180 (MCV)	0–75 (Hct)
Precision: • WBC count/RBC count	2.7%/1.2%	<3%/<1.5%
• Hemoglobin/platelet	0.93%/2.93%	<1.0%/<4.0%
• MCV or Hct	0.78% (MCV)	<1.5% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.997, y=1.02x-0.6; lymph% r=0.997, y=1.00x+0.8; mono% r=0.943, y=0.85x−0.3; eos% r=0.979, y=0.87x+0.2; baso% r=0.772, y=0.67x+0.0; luc% r=0.994, y=0.92+0.6	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922
Interfering substances: • WBC	incomplete RBC lysis (peroxidase only)	cold agglut., Plt aggreg., nucl. RBCs, lyse-resistant RBCs
• RBC	cold agglutinins, extreme sickle cell	cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis
• MCV or Hct	none	Hct: cold agglutinins, leukocytosis, ABN red cell fragility, spherocytosis
• Platelet	none	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts
• Hemoglobin	extreme lipemia, high WBC, extreme high bili.—interference w/colorimetric Hgb only, none with cellular Hgb	lipemia, ABN proteins, leukocytosis (>100,000/μL)
Interfering substances: differential	incomplete RBC lysis, complete myeloperoxidase deficiency	lyse-resistant RBCs
Age- and sex-specific reference ranges Max. CBCs per hr/max. CBCs & diffs. per hr Recommended average frequency of calib. • Modes calibrated/parameters calibrated Frequency of blood/latex controls Min. specimen vol. open/closed/sample dead vol. closed	yes 120/120 6 months auto sampler, closed, open/all measured parameters once per shift/not required 175 μL/175 μL/<300 (tube size dependent)	yes 150/150 once per year by FSR open, closed, capillary/WBC, RBC, Hb, Hct, Plt 2 levels once every 24 hours (minimum per CLIA)/none 130 μL/200 μL/1 mL
Tube sampling supported Veterinary capability Microsample capability Prepares microscopic slides automatically or flags problems for slide prep If automatic slidemaker available, No. installed/list price	2, 3, 5, 7, mL closed—all tube sizes open yes yes yes Advia Autoslide, —/$98,000	yes no yes yes (with Alpha or HST upgrade) >1,200/price depends on configuration
Archives patient data for later comparison Patient-specific archiving Max. archived data accessible when system online Memory capacity—numeric results–No. specimens Memory capacity—histo/cytograms–No. specimens • Stored in conjunction with CBC data • Histo/cytogram images & CBC data printed as 1 report Saved results can be recalled and retransmitted Saved data can be sorted for reprocessing or report transmission Performs delta checks Tags and holds results for followup, confirm. testing, or rerun Parameters for flags for holding samples are defined by Some results can be transmitted to LIS while others held Scattergram display: cell-specific color Histogram display: color with threshold Choice of desired specimen and/or result info. displayed	yes no 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes yes yes yes yes yes
LIS interface formats supported Information transferred on LIS interface LOINC codes transmitted with results How labs get LOINC codes for reagent kits Optional data mgmt. or collation system • Software features Interface avail. or planned to auto. specimen-handling system Bar-code symbologies read on tube Accommodates bar-code placement per CLSI standard Auto2A	proprietary (instrument or vendor specific) numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics and orders no Web site: online documentation yes, CentraLink enhanced QC, data archiving, data collation from multiple instruments, autovalidation, integrated diff. pad, remote diagnostics, remote workstations LabCell (Siemens) Codabar, codes 39 and 128, ASTM, interleaved 2 of 5 yes	ASTM 1394, TCP-IP, ASTM E1381 numeric and flag results, histograms and scatterplots, instrument to LIS; patient demographics, orders, LIS to instrument— broadcast; host query for demographics and orders yes contact vendor yes, Sysmex WAM (Work Area Manager) enhanced QC, data archiving, data collation from multiple instruments, rules setting Roche Diagnostics, and Labotix, A & T, Thermo, IDS Codabar, codes 39 and 128, ASTM, interleaved 2 of 5, ITF, NW7, EAN 8 and 13 —
Time required for maintenance by lab personnel Onboard maintenance records Time from communication of problem to engineer on site Onboard diagnostics/limited to software problems Mftr. can perform diagnostics via modem	daily: 10 min; weekly: 15 min; monthly: 15 min yes territory dependent yes/no yes	daily: <3 min yes <24 hours yes/no yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	laser technology provides direct cellular Hgb for RBCs and retics; 2-D Plt analysis eliminates interference from RBC fragments and inclusion of large Plts; dual WBC counts with a linearity of up to 400,000; CSF assay	low-end linearity for all body fluids; two-part differential (mono nuclear % + # and polymorphonuclear % + # or body fluid; reticulocyte hemoglobin content; immature platelet fractions; throughput of 150 CBCs per hour; random access; discrete testing; online QC; remote diagnostics, body fluid analysis; platelet linearity to 5 million, hematocrit linear to 75%; hematopoietic progenitor cell testing; immature granulocyte enumeration; immature platelet fraction; reticulocyte hemoglobin equivalent; standardized reagents, controls and operations with other Sysmex X series analyzers

Part 11 of 13	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa
Name of instrument First year installed in U.S./outside U.S./No. of units sold in 2008 No. units installed in U.S./outside U.S./list price	**Sysmex XE-2100** 1999/—/150 1,500/4,500/$225,000	**Sysmex XE-2100D** 2004/2004/25 60/—/$200,000
Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso)*:	standard menu (left) plus: NRBC %&#, retic %&#, RDW-SD, RDW-CV, IRF, Plt-O, HPC#, MPV, IG%, IG#, RET-He, IPF	standard menu (left) plus: RDW-SD, RDW-CV
• Laboratory	none	none
• Flags	Plt clumps, RBC agglut, turbidity, WBC ABN scattergram, RBC ABN distrib., Plt ABN distrib., RBC lyse resistance, blasts, left shift, atyp. lymph., ABN lymph./blast., ret. ABN scattergram	Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast, left shift, atyp. lymph., ABN lymph./blast, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity
FDA-cleared tests but not clinically released	none	—
Tests not available but submitted for clearance	none	—
Tests in development	—	—
For research use only	P-LCR, PCT, PDW	P-LCR, PCT, PDW
Tests unique to analyzer	HPC#, IG%, IG#, RET He, IPF	Optional: IG% & IG#
Differential method(s) used	fluorescent flow cytometry, RF/DC detecting method	fluorescent flow cytometry
Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)	0–440/0–8	0–440/0–8
• Hemoglobin (g/dL)/platelet (10^9/L)	0–25/0–5,000	0–25/0–5,000
• MCV (fL) or Hct (%)	0–75 (Hct)	0–75 (Hct)
Precision: • WBC count/RBC count	<3%/<1.5%	≤3%/≤1.5%
• Hemoglobin/platelet	<1.0%/<4.0%	≤1.0%/<4.0%
• MCV or Hct	<1.5% (Hct)	≤1.5% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922
Interfering substances: • WBC	cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs	cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
• RBC	cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis	cold agglut., severe microcytosis, frag. RBCs, leukocytosis
• MCV or Hct	Hct: cold agglutinins, leukocytosis, ABN red cell fragility, spherocytosis	Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis
• Platelet	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts
• Hemoglobin	lipemia, ABN proteins, leukocytosis (>100,000/µL)	lipemia, ABN proteins, leukocytosis (>100,000/µL)
Interfering substances: differential	lyse-resistant RBCs	lyse-resistant RBCs
Age- and sex-specific reference ranges	yes	yes
Max. CBCs per hr/max. CBCs & diffs. per hr	150/150	150/150
Recommended average frequency of calib.	once per year by FSR	once per year by FSR
• Modes calibrated/parameters calibrated	open, closed, capillary/WBC, RBC, Hb, Hct, Plt	open, closed, capillary/WBC, RBC, Hb, Hct, Plt
Frequency of blood/latex controls	per requirements/none	per CLIA requirements/none
Min. specimen vol. open/closed/sample dead vol. closed	130 µL/200 µL/1 mL	130 µL/200 µL/1 mL
Tube sampling supported	yes	yes
Veterinary capability	no	no
Microsample capability	yes	yes
Prepares microscopic slides automatically or flags problems for slide prep	yes with Alpha or HST upgrade	yes, with Alpha or HST upgrade
If automatic slidemaker available, No. installed/list price	>1,000/price depends on configuration	>1,000/price depends on configuration
Archives patient data for later comparison	yes	yes
Patient-specific archiving	yes	yes
Max. archived data accessible when system online	10,000 samples	10,000 samples
Memory capacity—numeric results–No. specimens	10,000 samples	10,000 samples
Memory capacity—histo/cytograms–No. specimens	10,000 samples	10,000 samples
• Stored in conjunction with CBC data	yes	yes
• Histo/cytogram images & CBC data printed as 1 report	yes	yes
Saved results can be recalled and retransmitted	yes	yes
Saved data can be sorted for reprocessing or report transmission	yes	yes
Performs delta checks	yes	yes
Tags and holds results for followup, confirm. testing, or rerun	yes	yes
Parameters for flags for holding samples are defined by	user or vendor	user or vendor
Some results can be transmitted to LIS while others held	yes	yes
Scattergram display: cell-specific color	yes	yes
Histogram display: color with threshold	yes	yes
Choice of desired specimen and/or result info. displayed	yes	yes
LIS interface formats supported	RS-232C/TCP IP	RS-232C/TCP IP
Information transferred on LIS interface	numeric and flag results, histograms and scatterplots, patient demographics, orders	numeric and flag results, histograms and scatterplots, patient demographics, orders
LOINC codes transmitted with results	yes	yes
How labs get LOINC codes for reagent kits	contact vendor	contact vendor
Optional data mgmt. or collation system	yes, Sysmex WAM (Work Area Manager)	yes, Sysmex WAM (Work Area Manager)
• Software features	enhanced QC, data archiving, data collation from multiple instruments, multiple sites	enhanced QC, data archiving, data collation from multiple instruments, multiple sites
Interface avail. or planned to auto. specimen-handling system	on automation platform	on automation platform
Bar-code symbologies read on tube	Codabar, codes 39 and 128, interl. 2 of 5, ITF, NW7, EAN 8 and 13	Codabar, codes 39 and 128, ASTM, interl. 2 of 5, ITF, NW7, EAN 8 and 13, ISBT
Accommodates bar-code placement per CLSI standard Auto2A	yes	yes
Time required for maintenance by lab personnel	daily: <3 min.	daily: <3 min.
Onboard maintenance records	yes	yes
Time from communication of problem to engineer on site	<24 hours	<24 hours
Onboard diagnostics/limited to software problems	yes/no	yes/no
Mftr. can perform diagnostics via modem	yes, also via Internet	yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	throughput of 150 CBCs per hour; random access; discrete testing; online QC; remote diagnostics, body fluid analysis; platelet linearity to 5 million, hematocrit linear to 75 percent; hematopoietic progenitor cell testing; immature granulocyte enumeration; immature platelet fraction; reticulocyte hemoglobin equivalent; standardized reagents, controls and operations with other Sysmex X series analyzers	150 CBC/hr; platelet linearity—5 million, hematocrit extended to 75 percent; standardized technology, reagents, controls and operations; ISBT compliant; new FDA-cleared application for blood component products in specified anticoagulants

Part 12 of 13	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	Sysmex XE-Alpha N/HST-N 2000/—/50 >600/1,100/$360,000–$1,000,000	Sysmex XT-2000i 2002/2001/160 4,900 worldwide/$145,000
Test menu: • Chartable *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso)***:**	standard menu (left) plus: NRBC%&#, Retic%&#, RDW-SD, RDW-CV, IRF, PLT-O, HPC#, MPV, IG%, IG#, RET-He, IPF	standard menu (left) plus: retic %&#, IRF, Plt-O, MPV, RDW-SD, RDW-CV, reticulocyte hemoglobin, immature granulocytes %&#
• Laboratory	none	none
• Flags	user defined, all inclusive	Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC, body fluids
FDA-cleared tests but not clinically released	none	—
Tests not available but submitted for clearance	none	—
Tests in development	—	—
For research use only	P-LCR, PCT, PDW	—
Tests unique to analyzer	NRBC, HPC#, IG%, IG#, Rct-He, immature platelet function (IPF)	Plt-O, immature granulocytes (IG) %&#, reticulocyte hemoglobin (RET-He)
Differential method(s) used	fluorescent flow cytometry, RF/DC detecting method	fluorescent flow cytometry
Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)	0–440/0–8	0–310/0–8
• Hemoglobin (g/dL)/platelet (10^9/L)	0–25/0–5,000	0–25/0–5,000
• MCV (fL) or Hct (%)	0–75 (Hct)	0–60 (Hct)
Precision: • WBC count/RBC count	<3%/<1.5%	≤3.0%/≤1.5%
• Hemoglobin/platelet	<1.0%/<4.0%	≤1.5%/<4.0%
• MCV or Hct	<1.0% (Hct)	≤1.5% (Hct)
Accuracy of automated diff. compared with manual diff. (per CLSI H-20A), regression equation	neut% r=0.95, y=0.92x+5.46; lymph% r=0.95, y=0.88x+2.46; mono% r=0.79, y=0.77x+1.88; eos% r=0.92, y=0.97x+0.29; baso% r=0.82, y=1.01x+0.01; NRBC% r=0.96, y=1.12x+0.11; IG% r=0.83, y=0.9332x+0.0922	neut% r=0.95, y=0.95x+3.38; lymph% r=0.96, y=0.85x+1.67; mono% r=0.90, y=11.37x+1.89; eos% r=0.94, y=0.87x+0.04; baso% r=0.76, y=0.48x+0.24
Interfering substances: • WBC	cold agglut., Plt aggreg., nucl. RBCs, cryoglob., lyse-resistant RBCs	cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
• RBC	cold agglut., severe microcytosis, frag. RBCs, large No. giant Plts, in vitro hemolysis	cold agglut., severe microcytosis, frag. RBCs, leukocytosis
• MCV or Hct	Hct: cold agglut., leukocytosis, ABN red cell fragility, spherocytosis	Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/µL)
• Platelet	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megalocytic Plts	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts
• Hemoglobin	lipemia, ABN proteins, leukocytosis (>100,000/µL)	lipemia, ABN proteins, leukocytosis (>100,000/µL)
Interfering substances: differential	lyse-resistant RBCs	lyse-resistant RBCs
Age- and sex-specific reference ranges	yes	yes
Max. CBCs per hr/max. CBCs & diffs. per hr	150/150 per analyzer on automation system	80/80
Recommended average frequency of calib.	once per year by FSR	once per year by FSR
• Modes calibrated/parameters calibrated	open, closed, capillary/WBC, RBC, Hb, Hct, Plt	open, closed, capillary/—
Frequency of blood/latex controls	two levels once every 24 hours (minimum CLIA)/none	per CLIA requirements/none
Min. specimen vol. open/closed/sample dead vol. closed	130 µL/200 µL/1 mL	85 µL/150 µL/1 mL
Tube sampling supported	yes	yes
Veterinary capability	no	yes, XT-V product
Microsample capability	yes	yes
Prepares microscopic slides automatically or flags problems for slide prep	yes	no
If automatic slidemaker available, No. installed/list price	>1,700/$250,000	—
Archives patient data for later comparison	yes	yes
Patient-specific archiving	yes	yes
Max. archived data accessible when system online	10,000 samples	10,000 samples
Memory capacity—numeric results–No. specimens	10,000 samples; 20,000 orders	10,000 samples
Memory capacity—histo/cytograms–No. specimens	10,000 samples; 2 years plus, with optional decision logic software	10,000 samples
• Stored in conjunction with CBC data	yes	yes
• Histo/cytogram images & CBC data printed as 1 report	yes	yes
Saved results can be recalled and retransmitted	yes	yes
Saved data can be sorted for reprocessing or report transmission	yes	yes
Performs delta checks	yes	yes
Tags and holds results for followup, confirm. testing, or rerun	yes	yes
Parameters for flags for holding samples are defined by	user and vendor	user or vendor
Some results can be transmitted to LIS while others held	yes	yes
Scattergram display: cell-specific color	yes	yes
Histogram display: color with threshold	yes	yes
Choice of desired specimen and/or result info. displayed	yes	yes
LIS interface formats supported	RS-232C/TCP IP	RS-232/TCP-IP, ASTM
Information transferred on LIS interface	numeric and flag results, histograms and scatterplots, patient demographics, orders	numeric and flag results, histograms and scatterplots, patient demographics, orders
LOINC codes transmitted with results	yes	yes
How labs get LOINC codes for reagent kits	contact vendor	contact vendor
Optional data mgmt. or collation system	yes, Sysmex WAM (Work Area Manager)	yes, Sysmex WAM (Work Area Manager)
• Software features	enhanced QC, data archiving, data collation from multiple instruments, multiple sites	enhanced QC, data archiving, data collation from multiple instruments
Interface avail. or planned to auto. specimen-handling system	Roche, Labotix, IDS, A&T, Thermo engen	—
Bar-code symbologies read on tube	Codabar, codes 39 and 128, interl. 2 of 5, ITF, NW7, EAN 8 and 13	Codabar, codes 39 and 128, interl. 2 of 5, ITF, NW7, EAN 8 and 13
Accommodates bar-code placement per CLSI standard Auto2A	yes	yes
Time required for maintenance by lab personnel	daily: <3 min (operator time)	daily: <3 min
Onboard maintenance records	yes	yes
Time from communication of problem to engineer on site	<24 hours	<24 hours
Onboard diagnostics/limited to software problems	yes/no	yes/no
Mftr. can perform diagnostics via modem	yes, also via Internet	yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	high-throughput, flexible, scalable configurations available (>125 standard configurations available); platelet linearity—5 million; new parameters for platelet monitoring—IPF & retic Hb measurement & RET He, hematopoietic progenitor cell analysis, lavender top management, standardized technology, reagents, controls, and operations; broader clinical reportable ranges; enhanced clinical parameters to support preventive care and disease management	high throughput, remote diagnostics; online QC; random access; fluorescent optical platelets; discrete testing; reagent monitoring; customized chartable report formats; body fluids, standardized technology, reagents, controls, and operations with other X series analyzers; IG # & %, RET-He; XT-V unit for use in toxicology, research, and veterinary reference labs

Hematology analyzers

Part 13 of 13	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa	Sysmex America Inc. Tammy Kutz kutzt@sysmex.com 1 Nelson C. White Pkwy. Mundelein, IL 60060 800-379-7639 www.sysmex.com/usa
Name of instrument **First year installed in U.S./outside U.S./No. of units sold in 2008** **No. units installed in U.S./outside U.S./list price**	Sysmex XT-1800i 2002/2001/60 860/4,600/$125,000	XS-1000i and XS-1000i AutoLoader (20 sample autoloader option) 2006/2005/300 935/5,000/$85,000 (XS-1000i) $95,000 (AutoLoader)

Test menu: • **Chartable** *(standard menu: WBC, RBC, Hb, Hct, MCV, MCH, MCHC, Plt, %&# neut, mono, lymph, eos, baso)*:
  • **Laboratory**
  • **Flags**
 	
FDA-cleared tests but not clinically released
Tests not available but submitted for clearance
Tests in development
For research use only
Tests unique to analyzer
	standard menu (left) plus: MPV, RDW-SD, RDW-CV, immature granulocytes %&#
	
	none
	Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC, body fluids
	none
	none
	—
	—
	immature granulocytes (IG%&#)
		standard menu (left) plus: MPV, RDW-SD, RDW-CV
		
		none
		Plt clumps, Plt ABN distribution, WBC ABN scattergram, blast imm. gran., left shift, atyp. lymph., ABN lymph./blasts, RBC ABN distribution, RBC lyse resistance, RBC agglut., turbidity, NRBC
		none
		none
		IG%
		research screen
		—

Differential method(s) used
 	
Linearity: • WBC count (10^9/L)/RBC count (10^{12}/L)
  • Hemoglobin (g/dL)/platelet (10^9/L)
  • MCV (fL) or Hct (%)
Precision: • WBC count/RBC count
  • Hemoglobin/platelet
  • MCV or Hct
Accuracy of automated diff. compared with manual diff.
(per CLSI H-20A), regression equation
 	
Interfering substances: • WBC
 	
  • RBC
 	
  • MCV or Hct
 	
  • Platelet
 	
  • Hemoglobin
 	
Interfering substances: differential
	fluorescent flow cytometry
	
	0–310/0–8
	0–25/0–5,000
	0–60 (Hct)
	≤3.0%/≤1.5%
	≤1.5%/≤4.0%
	≤1.5% (Hct)
	neut% r=0.95, y=0.95x+3.38; lymph% r=0.96, y=0.85x+1.67; mono% r=0.90, y=11.37x+1.89; eos% r=0.94, y=0.87x+0.04; baso% r=0.76, y=0.48x+0.24
	
	cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
	
	cold agglut., severe microcytosis, frag. RBCs, leukocytosis
	
	Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/µL)
	pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts
	
	lipemia, ABN proteins, leukocytosis (>100,000/µL)
	
	lyse-resistant RBCs
		fluorescent flow cytometry
		
		0–400/0-8
		0-25/0–5,000
		0–60 (Hct)
		—/—
		—/—
		—
		neut% r=0.96, y=0.9074x+3.8948; lymph% r=0.97, y=0.9017x+2.4817; mono% r=0.78, y=0.8626x+3.5938; eos% r=0.94, y=0.9076x+0.3651; baso% r=0.29, y-0.1538x+0.298
		
		cold agglut., Plt aggreg., cryoglob., lyse-resistant RBCs, NRBCs
		
		cold agglut., severe microcytosis, frag. RBCs, leukocytosis
		
		Hct: cold agglut., ABN red cell fragility, spherocytosis, leukocytosis (>100,000/µL)
		pseudothrombocytopenia, Plt aggreg., incr. microcytosis, megaloblasts
		
		lipemia, ABN proteins, leukocytosis (>100,000/µL)
		
		lyse-resistant RBCs

Age- and sex-specific reference ranges **Max. CBCs per hr/max. CBCs & diffs. per hr** **Recommended average frequency of calib.** • **Modes calibrated/parameters calibrated** **Frequency of blood/latex controls** **Min. specimen vol. open/closed/sample dead vol. closed** **Tube sampling supported** **Veterinary capability** **Microsample capability** **Prepares microscopic slides automatically or flags problems for slide prep** **If automatic slidemaker available, No. installed/list price**	yes 80/80 once per year by FSR open, closed, capillary/— per CLIA requirements/none 85 µL/150 µL/1 mL yes yes, XT-V product yes no —	yes 60/60 once per year closed & capillary/— per CLIA requirements/none 20 µL/20 µL/1.0 mL yes (up to 85 mm height) no yes no —
Archives patient data for later comparison **Patient-specific archiving** **Max. archived data accessible when system online** **Memory capacity—numeric results–No. specimens** **Memory capacity—histo/cytograms–No. specimens** • **Stored in conjunction with CBC data** • **Histo/cytogram images & CBC data printed as 1 report** **Saved results can be recalled and retransmitted** **Saved data can be sorted for reprocessing or report transmission** **Performs delta checks** **Tags and holds results for followup, confirm. testing, or rerun** **Parameters for flags for holding samples are defined by** **Some results can be transmitted to LIS while others held** **Scattergram display: cell-specific color** **Histogram display: color with threshold** **Choice of desired specimen and/or result info. displayed**	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes	yes yes 10,000 samples 10,000 samples 10,000 samples yes yes yes yes yes yes user or vendor yes yes yes yes
LIS interface formats supported **Information transferred on LIS interface** **LOINC codes transmitted with results** **How labs get LOINC codes for reagent kits** **Optional data mgmt. or collation system** • **Software features** **Interface avail. or planned to auto. specimen-handling system** **Bar-code symbologies read on tube** **Accommodates bar-code placement per CLSI standard Auto2A**	RS-232C/TCP-IP, ASTM numeric and flag results, histograms and scatterplots, patient demographics, orders yes contact vendor yes, Sysmex WAM (Work Area Manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites — Codabar, codes 39 and 128, interl. 2 of 5, ITF, NW7, EAN 8 and 13 yes	proprietary, ASTM 1394, TCP-IP numeric and flag results, histograms and scatterplots, patient demographics, orders yes contact vendor yes, Sysmex WAM (Work Area Manager) enhanced QC, data archiving, data collation from multiple instruments, multiple sites — Codabar, codes 39 and 128, ASTM, interl. 2 of 5, NW7, EAN 8 and 13, ITF yes
Time required for maintenance by lab personnel **Onboard maintenance records** **Time from communication of problem to engineer on site** **Onboard diagnostics/limited to software problems** **Mftr. can perform diagnostics via modem**	daily: <3 min. yes <24 hours yes/no yes, also via Internet	daily: 3 min; weekly: none; monthly: 9 min yes <24 hours yes/no yes, also via Internet
Acquisition program based on cost-per-reportable result	yes	yes
Distinguishing features	remote diagnostics; online QC; random access; discrete testing; reagent monitoring; chartable report formats; unique specimen-gating, software is FDA Part II compliant; body fluids now FDA cleared; standardized technology, reagents, controls, and operations with other X series analyzers; XT-V for use in toxicology, research, and veterinary reference labs	standardized technology, reagents, controls, and operations to other X series analyzers; small sample volume requirements for CBC + five-part diff.; remote diagnostics, online QC, discrete analysis, reagent monitoring, chartable report; remote calibration verification