

# ABL800 FLEX analyzer

## Specifications



# Parameters

Type	Parameter	Units	Measuring range	805	810*	815	817	820	825	827	830	835	837	
pH	pH**	pH scale	6.300–8.000	X	X	X	X	X	X	X	X	X	X	
	cH <sup>+</sup>	nmol/L	10.0–501											
Blood gas	pCO <sub>2</sub>	mmHg	5.0–250	X	X	X	X	X	X	X	X	X	X	
		kPa	0.67–33.3											
		Torr	5.0–250											
	pO <sub>2</sub>	mmHg	0.0–800	X	X	X	X	X	X	X	X	X	X	
		kPa	0.00–107											
		Torr	0.0–800											
Electrolyte	cCl <sup>-</sup>	mmol/L	7–350	X		X	X		X	X		X	X	
		meq/L	7–350											
	cCa <sup>2+</sup>	mmol/L	0.20–9.99	X		X	X		X	X		X	X	
		meq/L	0.40–19.98											
		mg/dL	0.80–40.04											
	cK <sup>+</sup>	mmol/L	0.5–25.0	X		X	X		X	X		X	X	
		meq/L	0.5–25.0											
	cNa <sup>+</sup>	mmol/L	7–350	X		X	X		X	X		X	X	
		meq/L	7–350											
	Metabolite	cGlu	mmol/L	0.0–60	X		X	X		X	X		X	X
mg/dL			0–1081											
cLac		mmol/L	0.0–30	X		X	X		X	X		X	X	
		mg/dL	0–270											
		meq/L	0.0–30											
cCrea		μmol/L	10–1800				X			X			X	
		mg/dL	0.1–20.3											
ctBil		μmol/L	0–1000									X	X	X
		mg/dL	0.0–58.5											
		mg/L	0–585											
Oximetry		ctHb	g/dL	0.00–27.7		X	X	X	X	X	X	X	X	X
			mmol/L	0.00–17.2										
	g/L		0.0–277											
	sO <sub>2</sub>	%	0.0–100.0		X	X	X	X	X	X	X	X	X	
		Fraction	0.000–1.000											
	fO <sub>2</sub> Hb	%	0.0–100.0					X	X	X	X	X	X	
		Fraction	0.000–1.000											
	fCOHb	%	0.0–100.0					X	X	X	X	X	X	
		Fraction	0.000–1.000											
	fMethHb	%	0.0–100.0					X	X	X	X	X	X	
		Fraction	0.000–1.000											
	fHHb	%	0.0–100.0					X	X	X	X	X	X	
		Fraction	0.000–1.000											
	fHbF	%	0–100								X	X	X	
		Fraction	0.00–1.00											

\* Available in a pH, pCO<sub>2</sub> and pO<sub>2</sub> only version

\*\* Also available as pH in pleural fluid; currently not for sale in the US and Canada

The *Measuring range* for a parameter is the range within which the analyzer is physically capable of measuring. The measuring range corresponds to the 'range of indication' as defined in the 'International vocabulary of basic and general terms in metrology' (VIM).



## Sample volume

Analyzer	Mode	Sample volume ( $\mu\text{L}$ )	Measuring time (sec)	Cycle time (sec)	Samples/hr
ABL825	FLEXMODE	35–195	80–135	150–200	18–24
	all parameters	195	80	150	24
	all parameters, micro	95	135	200	18
ABL837	all parameters	250	100	170	21
	all parameters, micro	125	150	225	16
ABL825	pH + BG + Oxi, micro	85	80	170	21
ABL837	pH + BG, micro	55	100	170	21
	Glu + Lac, micro	35	80	145	25
	Oxi, micro	35	80	145	25
	Expired air	15	80	170	21
	pH in pleural fluid	85	80	170	21

Other analyzer versions will have other measuring times/volumes

## Input parameters

Type	Definition	Type	Definition
Patient ID	Patient identification number	Operator department	Department where the operator is from
Patient height	The height of the patient	$p50(st)$	Oxygen tension at 50 % saturation of blood at standard conditions for pH, $p\text{CO}_2$ , $F\text{COHb}$ , $F\text{MetHb}$ , $\text{HbF}$ at 37°C
Patient department	Which department the patient is from	RQ	Respiratory quotient
$T$	Patient temperature	$F\text{O}_2(I)$	Fraction of oxygen in dry inspired air
Sample type	Arterial, venous, mixed venous, capillary, prof. test, cal. verification	$\dot{Q}_t$	Cardiac output
Patient note	Notes about the patient or sample	$\dot{V}\text{O}_2$	Oxygen consumption
Patient weight	The weight of the patient	VCO	Volume of carbon monoxide, input value for measurement of $V(B)$
Patient accession no.	Specific sample number	$s\text{O}_2(\bar{v})$	Oxygen saturation of hemoglobin in mixed venous blood
Patient age	Date of birth	$p\text{O}_2(\bar{v})$	Oxygen tension of mixed venous blood
Patient sex	Male or female	ctHb	Total hemoglobin concentration (if not measured)
Draw time	When the sample was taken	$F\text{COHb}(1)$	Used for determining blood volume
Date of birth	Patient date of birth	$F\text{COHb}(2)$	Used for determining blood volume
Sample site	Not specified, brachial left/right, femoral left/right, radial left/right, finger left/right, heel left/right, umbilical cord		
Patient birth weight	The weight of the newborn		
Patient gestational age	Period of intrauterine fetal development from conception to birth		
Patient name	Name of the patient		
Physician	Name of the physician		
Operator	Name of the operator		

Parameters can be set for mandatory input and are user-definable.

# Derived parameters

## Derived parameters

Type	Definition
pH(T)	pH of blood at patient temperature
pCO <sub>2</sub> (T)	Carbon dioxide tension of blood at patient temperature
cHCO <sub>3</sub> (P)	Concentration of hydrogen carbonate in plasma
cBase(B)	Concentration of titrable base of blood (actual base excess)
cBase(B,ox)	Actual base excess at 100 % oxygen saturation
cBase(Ecf)	Concentration of titrable base of extracellular fluid (standard base excess)
cBase(Ecf,ox)	Standard base excess at 100 % oxygen saturation
cHCO <sub>3</sub> (P,st)	Concentration of hydrogen carbonate in plasma of standardized blood (standard bicarbonate)
cH <sup>+</sup>	Concentration of hydrogen ions in blood
cH <sup>+</sup> (T)	Concentration of hydrogen ions in blood at patient temperature
ctCO <sub>2</sub> (P)	Concentration of total carbon dioxide in plasma
ctCO <sub>2</sub> (B)	Concentration of total carbon dioxide of whole blood (CO <sub>2</sub> content)
pH(st)	pH of standardized blood (pCO <sub>2</sub> = 40 mmHg)
pO <sub>2</sub> (T)	Oxygen tension of blood at patient temperature
pO <sub>2</sub> (A)	Oxygen tension of alveolar air
pO <sub>2</sub> (A,T)	Oxygen tension of alveolar air at patient temperature
p50	Oxygen tension at 50 % saturation of blood
p50(T)	Oxygen tension at 50 % saturation of blood at patient temperature
p50(st)	Oxygen tension at 50 % saturation of blood at standard conditions for pH, pCO <sub>2</sub> , FCOHb, FMetHb, FHbF at 37 °C
pO <sub>2</sub> (A-a)	Difference of oxygen tension of alveolar air and arterial blood
pO <sub>2</sub> (A-a,T)	Difference of oxygen tension of alveolar air and arterial blood at patient temperature
pO <sub>2</sub> (a/A)	Ratio of oxygen tension of arterial blood and alveolar air
pO <sub>2</sub> (a/A,T)	Ratio of oxygen tension of arterial blood and alveolar air at patient temperature
pO <sub>2</sub> (a)/FO <sub>2</sub> (I)	Oxygen tension ratio of arterial blood to the fraction of oxygen in inspired air
pO <sub>2</sub> (a,T)/FO <sub>2</sub> (I)	Oxygen tension ratio of arterial blood at patient temperature to the fraction of oxygen in inspired air
cCa <sup>2+</sup> (pH=7.40)	Concentration of ionized calcium in plasma at pH 7.40
Anion Gap(K <sup>+</sup> )	Concentration difference of K <sup>+</sup> + Na <sup>+</sup> and Cl <sup>-</sup> + HCO <sub>3</sub> <sup>-</sup>
Anion Gap	Concentration difference of Na <sup>+</sup> and Cl <sup>-</sup> + HCO <sub>3</sub> <sup>-</sup>

Type	Definition
DO <sub>2</sub>	Oxygen delivery
Hct	Fraction of the volume of erythrocytes in the volume of whole blood
pO <sub>2</sub> (x)	Oxygen extraction tension of arterial blood
pO <sub>2</sub> (x,T)	Oxygen extraction tension of arterial blood at patient temperature
ctO <sub>2</sub> (B)	Total oxygen concentration of blood (O <sub>2</sub> content)
ctO <sub>2</sub> (a- $\bar{v}$ )	Total oxygen concentration difference between arterial and mixed venous blood
BO <sub>2</sub>	Oxygen capacity of hemoglobin. The maximum concentration of oxygen bound to hemoglobin in blood, saturated so that all deoxyhemoglobin is converted to oxyhemoglobin
ctO <sub>2</sub> (x)	Extractable oxygen concentration of arterial blood
FShunt	Volume fraction of shunted venous blood in arterial blood
FShunt(T)	FShunt at patient temperature
RI	Respiratory Index
RI(T)	Respiratory Index at patient temperature
$\dot{V}O_2$	Oxygen consumption
mOsm	Plasma osmolality
Qx	Oxygen compensation factor of arterial blood
Q <sub>t</sub>	Cardiac output
V(B)	Volume of blood
sO <sub>2</sub>	Saturation
FO <sub>2</sub> Hb	Fraction of oxyhemoglobin in total hemoglobin in blood
GFR, if AA	Glomerular filtration rate, if African American
GFR, if non AA	Glomerular filtration rate, if non African American



# Quality control



Customized user-defined profiles including on-screen shortcut keys



Online assistance with audio-enhanced video tutorials, troubleshooting and help

## Calibration data

Automatic:	Default interval:	Interval options:
1-point cal.	4 hours	after measurement, 30 min, 1, 2, 4 hours
2-point cal.	8 hours	after measurement, 1, 2, 4, 8 hours
1-point gas cal.*	2 hours	30 min, 1, 2 hours
System alignment	24 hours	
Cleaning	8 hours	8, 24 hours
<b>Manual:</b>		
tHb calibration	3 months	never, 7 days, 1, 2, 3, 4, 6 months

\* US only

## AutoCheck technical specifications

Number of ampoules in carousel:	0–20
Positioning of ampoules in carousel:	Random
Lot change:	2 lots of same level at the same time possible
Liquid volume in ampoule:	700 µL
Expiration of ampoules:	24 months at 25 °C / 77 °F (including 15 days at up to 32 °C / 90 °F)
Conditioning time (from room temperature):	15 min with filled carousel
Scanning time:	< 30 sec with filled carousel
Cycle time:	< 2 min 40 sec
Manual QC measurement possible:	Yes
Remote control:	Remote monitoring and start of measurement via the RADIANCE system

# IT

## Computer specifications

Intel Celeron Processor  
128 MB RAM  
Hard disk 40 GB  
TFT 10.4" VGA color touch screen  
Dedicated 80386 CPU for wet section operations

## Software platform

Windows®XP Embedded  
Sybase®  
VxWorks®

## Interface

Integrated barcode reader  
Serial line RS232  
RJ45 Ethernet port  
Option ports for mouse and keyboard  
3 USB ports

## Data capacity

Patient results:	2000
Calibration results:	1000
QC results:	1500
System messages and service registrations:	5000

## Communication

Access to Local Area Network for backup, etc. :  
using PC network operating systems  
supporting Windows®XP

Output protocols:

High-level protocols  
ABL700-compatible ASTM (E1394-91)  
ABL700-compatible HL7 (Version 2.2 + 2.5)  
ABL5xx-compatible ASTM (E1394-91)  
POCT 1A

Low-level protocols  
ASTM (E1381-95)  
Raw (serial only)

Transport layer  
TCP/IP  
RS232

RADIANCE interface via  
Ethernet adapter

## FLEXQ

Module that allows queuing of samplers on the ABL800 FLEX.	
Slots for samplers	3
Sampler type	safePICO with safeTIPCAP
Sampler identification	Integrated barcode scanner
Sample mixing time	7 seconds



USB support for easy data backup. Data is automatically archived.



Automatic sample identification, mixing and sampling.



Bi-directional interface for LIS/HIS, MPI look-up and paperless reporting.



Monitor and control the ABL800 FLEX analyzer remotely with the RADIANCE system. Also interfaces to non-Radiometer analyzers.

# Additional information

## Dimensions

Width	70 cm	28 in		
Height	55 cm	22 in		
Depth	53 cm	21 in		
Weight	ABL837, ABL827, ABL817	35.1 kg	77.4 lbs	
	ABL835, ABL825, ABL815	34.2 kg	75.5 lbs	
	ABL830, ABL820, ABL810, ABL805	33.2 kg	73.2 lbs	
Warm-up time	Cold start: 25 min typical. Warm start: 5 min			
Ambient temperature	15–32 °C / 59–90 °F			
Relative humidity	20–80 %			
Thermostatting	pH and blood gases, 37.0 °C ± 0.15 °C / 98.6 °F ± 0.3 °F Electrolytes and metabolites, 37.0 °C ± 0.25 °C / 98.6 °F ± 0.5 °F			
Spectrometer	128-wavelength measurement			
Hemolyzer frequency	30 KHz intracuvette hemolysis			
Barometer	450–800 mmHg			
Power	100–240 VAC, 50–60 Hz, 270 VA			

## Other



Indicates compliance with the IVD Directive 98/79/EC

EMC Emission	The equipment complies with the emission requirements for Class B equipment in EN 61326-1: Electrical equipment for measurement, control and laboratory use – EMC requirements part 1: General requirements
EMC Immunity	The equipment complies with the immunity requirements in EN 61326-1: Electrical equipment for measurement, control and laboratory use – EMC requirements part 1: General requirements
Patents	One or more of the following patents and patent applications may apply: US Patent Nos.: US6051389, US6099804, US6551480, US6689318, US6880384, US6980285 European Patent Nos.: EP889951, EP944731, EP1084398, EP1086366 Japanese Patent Nos.: JP2972351, JP3285879, JP3369547, JP4229912, JP4431147 German Patent Nos.: DE69729185, DE69735127, DE69938550, DE69942250 US Patent Application No.: US2006-0275857, US2006-0275860, US2008-0254542 European Patent Application Nos.: EP1273920, EP1583952, EP1692522, EP1885871, EP1889075 Japanese Patent Application Nos.: JP2008-541103, JP2008-545952 Chinese Patent Application Nos.: CN101175999, CN101184851
Approvals	CSA, UL. In compliance with IEC 61010-1 Installation Category II
Languages	English, German, Spanish, Italian, French, Japanese, Chinese, Portuguese, Danish, Swedish, Norwegian, Dutch, Greek, Hungarian, Estonian, Russian, Polish and Lithuanian.

IVD



# ACUTE CARE TESTING