

# ABL800 FLEX analyzer

## Specifications



# Measured 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											
FCO <sub>2</sub> Hb		%	0.0–100.0					X	X	X	X	X	X	
		Fraction	0.000–1.000											
F <sub>Met</sub> Hb		%	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).



# Derived and input parameters

## Derived parameters

### Parameter Description

Parameter	Description
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>
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-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
VO <sub>2</sub>	Oxygen consumption
mOsm	Plasma osmolality
Qx	Oxygen compensation factor of arterial blood
Q <sub>i</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

## Input parameters

### Type Definition

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

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

# General information

## Hardware

### Computer specifications

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

### Interface

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

## Software

### Software platform

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Windows®XP Embedded  
Sybase®  
VxWorks®

### Data capacity

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

## Additional information

### Dimensions

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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	

### FLEXQ

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

### Communication

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**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)  
OCT 1A  
Low-level protocols  
ASTM (E1381-95)  
Raw (serial only)  
Transport layer  
TCP/IP  
RS232  
RADIANCE interface via  
Ethernet adapter

### Other

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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

# Analyzer performance

## Measuring system

Analyzer	Mode	Sample volume (µL)	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	85	80	145	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

## 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

# ACUTE CARE TESTING