

## Analyzer performance

### Measuring system

Sample volume (all parameters)	65 µL
Measuring time (all parameters)	35 sec*)
Cycle time	60 sec*)
Throughput	44 samples/per hour*)
Average uptime	23.5 hours/per day**)

\*) May vary during startup  
 \*\*) May vary during startup; 2.5 min for system calibration is the longest activity

### Sensor cassette

#### Lifetime and storage

In-use lifetime	30 days (or until max number of tests)
Shelf life	4 months
Storage temperature	2–8°C / 35–46°F
Automatic QC	Yes

Parameter panels	50 tests	100 tests	300 tests	600 tests	900 tests
BG / OXI with QC	x	x	x	x	x
BG / LYT / OXI with QC	x	x	x	x	x
BG / LYT / MET / OXI with QC	x	x	x	x	x

Not all variants are available at the time of introduction and additional variants may be introduced

### Solution pack

#### Lifetime and storage

In-use lifetime	30 days (or until solution pack is empty, see table below)
Shelf life	4 months
Storage temperature	2–25°C / 35–77°F

#### Estimated lifetime of solution packs

No of tests per day	5	10	15	20	30	50
Estimated in-use lifetime (days)	30	30	24	20	15	10

### Quality management

#### Automatic quality management system

- 3 dedicated QC solutions
- Automatic detection and correction of failures
- Continuous system and analysis checks
- Air detection
- Automatic lockout of parameter that fails QC
- Customizable QC schedule
- Commonly used statistics (Levey Jennings plots)



# ACUTE CARE TESTING

## ABL90 FLEX analyzer Specifications



## Measured parameters

Type	Parameter	Units	Range of indication
pH	pH	pH scale	6.3–8.0
Blood gas	$p\text{CO}_2$	mmHg; Torr	5–250
		kPa	0.67–33.3
	$p\text{O}_2$	mmHg; Torr	0–800
		kPa	0–107
Electrolyte	cK <sup>+</sup>	mmol/L	0.5–25
		meq/L	0.5–25
	cNa <sup>+</sup>	mmol/L	7–350
		meq/L	7–350
	cCa <sup>2+</sup>	mmol/L	0.2–9.99
		meq/L	0.4–19.98
mg/dL		0.8–40.04	
cCl <sup>-</sup>	mmol/L	7–350	
	meq/L	7–350	
Metabolite	cGlu	mmol/L	0–60
		mg/dL	0–1081
	cLac	mmol/L	-0.1–31
		meq/L	-0.1–31
	mg/dL	-1–279	
Oximetry	sO <sub>2</sub>	%	-2–102
		fraction	-0.02–1.02
	ctHb	g/dL	-0.48–27.7
		g/L	-4.8–277
		mmol/L	-0.30–17.2
	FO <sub>2</sub> Hb	%	-2–103
		fraction	-0.02–1.03
	FCOHb	%	-2–103
		fraction	-0.02–1.03
	fMetHb	%	-2–103
		fraction	-0.02–1.03
	fHHb	%	-2–102
fraction		-0.02–1.02	
fHbF	%	-25–121	
	fraction	-0.25–1.21	
ctBil	$\mu\text{mol/L}$		-20–1000
			-1.2–58.5
			-12–585

The *Range of indication* for a parameter is the range within which the analyzer is physically capable of measuring.

## Derived and input parameters

### Derived parameters

Parameter	Description
pH(T)	pH of blood at patient temperature
$p\text{CO}_2(T)$	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 ( $p\text{CO}_2 = 40$ mmHg)
$p\text{O}_2(T)$	Oxygen tension of blood at patient temperature
$p\text{O}_2(A)$	Oxygen tension of alveolar air
$p\text{O}_2(A,T)$	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, $p\text{CO}_2$ , fCOHb, fMetHb, fHbF at 37°C
$p\text{O}_2(A-a)$	Difference of oxygen tension of alveolar air and arterial blood
$p\text{O}_2(A-a,T)$	Difference of oxygen tension of alveolar air and arterial blood at patient temperature
$p\text{O}_2(a/A)$	Ratio of oxygen tension of arterial blood and alveolar air
$p\text{O}_2(a/A,T)$	Ratio of oxygen tension of arterial blood and alveolar air at patient temperature

### Input parameters

Type	Definition
Patient ID	Patient identification number
Patient height	The height of the patient
Patient department	Which department the patient is from Patient temperature
Sample type	Arterial, venous, mixed venous, capillary, prof. test, cal. verification
Patient note	Notes about the patient or sample
Patient weight	The weight of the patient
Patient accession no.	Unique sample order number
Patient age	The age of the patient
Patient sex	Male or female
Draw time	When the sample was taken
Date of birth	Patient date of birth
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

$p\text{O}_2(a)/\text{FO}_2(i)$	Oxygen tension ratio of arterial blood to the fraction of oxygen in inspired air
$p\text{O}_2(a,T)/\text{FO}_2(i)$	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>
Anion Gap	Concentration difference of Na <sup>+</sup> and Cl <sup>-</sup> + HCO <sub>3</sub>
DO <sub>2</sub>	Oxygen delivery
Hct	Fraction of the volume of erythrocytes in the volume of whole blood
$p\text{O}_2(x)$	Oxygen extraction tension of arterial blood
$p\text{O}_2(x,T)$	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

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
Operator department	Department where the operator is from
RQ	Respiratory quotient
FO <sub>2</sub> (i)	Fraction of oxygen in dry inspired air
Q <sub>i</sub>	Cardiac output
VO <sub>2</sub>	Total oxygen consumption
VCO <sub>2</sub>	Volume of carbon monoxide, input value for measurement of V(B)
sO <sub>2</sub> (v)	Oxygen saturation in mixed venous blood
$p\text{O}_2(v)$	Oxygen tension in mixed venous blood
ctHb	Total hemoglobin concentration (if not measured)
FCOHb(1)	Used for determining blood volume
FCOHb(2)	Used for determining blood volume

## General information

### Hardware

#### Computer specifications

Processor Intel Celeron® M 600 MHz with 512K L2 Cache  
1 GB RAM  
2 GB SolidState storage  
8.4" color TFT-LCD, resolution 800 × 600 SVGA Touch screen  
4" thermal-sensitive printer

#### Sample mixer

Mixing time 7 seconds  
For safePICO samplers

### Software

#### Software platform

Windows® XP Embedded  
Sybase® SQL Anywhere

#### Data capacity

Patient log: 2000  
Activity log: 5000  
Calibration adjustment log: 1000  
Data secured by password protection  
8 different user profiles  
Unlimited ID access verification

#### Printer display options

Auto print (on/off)  
Select derived parameters  
Select input variables  
Reference ranges with results

### Additional information

#### Dimensions

Height	45 cm	17.7 in
Width	25 cm	9.8 in
Depth	29 cm	11.4 in
Weight	11 kg	24.4 lbs

### Interface

Built-in barcode reader for operator & sampler ID  
Accepted codes: UPC/EAN, Code 128, Code 39, Code 93, I 2 of 5, Discrete 2 of 5, Codabar and more  
Serial interface RS232 with power for external barcode reader  
3 USB connections  
Optional external keyboard  
Optional external mouse  
Optional external barcode reader

### Inlet

Left/right hand operation  
Position for syringe as well as capillary and test tube  
Aspiration from capillary without adapter  
Aspiration time 5 seconds

### Security and QA features

Advanced planning of replacement and QC schedules  
Optional automatic QC at startup and after replacements  
Customizable QC and calibration schedule

### Communication

#### HIS/LIS communication

High-level protocols:  
ASTM  
HL7  
POCT1-A

Low-level serial protocols:  
ASTM 1381-91, E1394-91  
Serial RAW

Low-level network protocols:  
TCP/IP

#### RADIANCE communication

Interface via Ethernet adapter

### Other

Startup time	1.5 hours average (less than 4 hours)
Operating environment	15–32°C / 59–89.6°F, 20–80% RH
Altitude correction	Up to 3000 m / 9,843 feet above sea level
Power	100–240 V; 50–60 Hz; 250VAC
Thermostat control	Sensor cassette: 37±0.15°C / 98.6±32.27°F Oximetry: 37±0.30°C / 98.6±32.54°F