



ANESTHETIC AGENT ANALYZER



AA-8000

USER MANUAL

**BC BIOMEDICAL
AA-8000
TABLE OF CONTENTS**

WARNINGS, CAUTIONS, NOTICES	ii
DESCRIPTION.....	1
OVERVIEW.....	3
KEYS.....	4
SCREENS.....	6
SETUP	13
CONNECTIONS.....	16
CALIBRATION	17
COMMUNICATION PROTOCOL	19
COMMAND SUMMARY	24
MANUAL REVISIONS.....	26
LIMITED WARRANTY.....	26
SPECIFICATIONS	27
NOTES.....	29

CALIBRATION INTERVAL

**To ensure the accuracy of the AA-8000, BC
Group International, Inc. recommends that it be
calibrated at least once every 12 months.
Calibration must be done by qualified personnel.
Contact BC Group International, Inc. for
calibration.**

WARNING - USERS

The AA-8000 is for use by skilled technical personnel only.

WARNING - USE

The AA-8000 is intended for testing only and should never be used in diagnostics, treatment or any other capacity where it would come in contact with a patient.

WARNING - CONNECTIONS

All connections to patients must be removed before connecting the DUT to the AA-8000. A serious hazard may occur if the patient is connected when testing with the AA-8000. Do not connect any leads or tubing from the patient directly to the AA-8000 or DUT.

CAUTION - MODIFICATIONS

The AA-8000 is intended for use within the published specifications. Any application beyond these specifications or any unauthorized user modifications may result in hazards or improper operation.

CAUTION – POWER ADAPTER

Turn Power Off and unplug any AC Power Adapter before cleaning the surface of the AA-8000.

CAUTION - CLEANING

Do not immerse. The AA-8000 should be cleaned by wiping gently with a damp, lint-free cloth. A mild detergent can be used if desired.

CAUTION - LIQUIDS

**Do not submerge or spill liquids on the AA-8000.
Do not operate the AA-8000 if internal
components may have been exposed to fluid.**

CAUTION - SERVICE

**The AA-8000 is intended to be serviced only by
authorized service personnel. Troubleshooting
and service procedures should only be
performed by qualified technical personnel.**

CAUTION - INSPECTION

**The AA-8000 should be inspected before each
use for wear and should be serviced if any parts
are in question.**

CAUTION - ENVIRONMENT




**Exposure to environmental conditions outside
the specifications can adversely affect the
performance of the AA-8000. Allow the AA-8000
to acclimate to specified conditions for at least
30 minutes before attempting to operate it.**

CAUTION - USE

**The AA-8000 is a Service Tool for anesthetic
service applications.**

It is NOT FOR CLINICAL USE.

NOTICE – SYMBOLS

<u>Symbol</u>	<u>Description</u>
	Caution (Consult Manual for Further Information)
	Center Negative
	Per European Council Directive 2002/95/EC, do not dispose of this product as unsorted municipal waste.

NOTICE – ABBREVIATIONS

AC	Alternating Current
C	Celsius
°	degree(s)
Des	Desflurane
DUT	Device Under Test
F	Fahrenheit
Halo	Halothane
Hr	Hours
Hz	Hertz
Iso	Isoflurane
kg	kilogram
mL	milliliter(s)
mm	millimeter(s)
min	minute(s)
Lbs	pounds
sec	second(s)
Sevo	Sevoflurane
USA	United States of America
VDC	Volts Direct Current

NOTICE – DISCLAIMER

BC GROUP INTERNATIONAL, INC. WILL NOT BE RESPONSIBLE FOR ANY INJURIES SUSTAINED DUE TO UNAUTHORIZED EQUIPMENT MODIFICATIONS OR APPLICATION OF EQUIPMENT OUTSIDE OF THE PUBLISHED INTENDED USE AND SPECIFICATIONS.

NOTICE – DISCLAIMER

BC GROUP INTERNATIONAL, INC. RESERVES THE RIGHT TO MAKE CHANGES TO ITS PRODUCTS OR SPECIFICATIONS AT ANY TIME, WITHOUT NOTICE, IN ORDER TO IMPROVE THE DESIGN OR PERFORMANCE AND TO SUPPLY THE BEST POSSIBLE PRODUCT. THE INFORMATION IN THIS MANUAL HAS BEEN CAREFULLY CHECKED AND IS BELIEVED TO BE ACCURATE. HOWEVER, NO RESPONSIBILITY IS ASSUMED FOR INACCURACIES.

NOTICE – CONTACT INFORMATION

BC BIOMEDICAL
BC GROUP INTERNATIONAL, INC.
3081 ELM POINT INDUSTRIAL DRIVE
ST. CHARLES, MO 63301
USA

1-800-242-8428
1-314-638-3800

www.bcgrouptl.com
sales@bcgrouptl.com

<p style="text-align: center;">BC BIOMEDICAL AA-8000 ANESTHETIC AGENT ANALYZER</p>

The AA-8000 is the latest in portable anesthetic agent analyzers. It has been designed to meet the demand for a small, easy-to-use unit with high reliability and accuracy. Utilizing proprietary state-of-the-art digital NDIR (Non-Dispersive Infrared) Technology it provides a low-cost, high-function, microprocessor-based analyzer that is simple to operate while maintaining high performance and accuracy.

The unit's flexible design and portable size makes it the ideal service tool for anesthesia service applications in hospitals and surgical centers. It has a slanted display and adjustable handle/stand to allow for ease of viewing. The internal rechargeable Lithium battery provides for hours of continuous operation.

One-Button selection of the Agent to be analyzed coupled with One-Button control over the sampling pump make the unit simple and quick to use. No complex menus or key combinations are required.

The internal data logger combined with the internal clock allows for the storage of up to 500 time and date stamped readings that can be downloaded to a computer using the USB interface.

Flash Memory and the USB interface allow for field upgrades with downloads from our website.

The following are highlights of the main features:

- State-of-the-art NDIR (Non-Dispersive Infrared) Technology
- Measures 4 Anesthetic Agent Gases:
 - Sevoflurane, Isoflurane, Desflurane and Halothane
- Small, Portable unit with adjustable Handle/Stand
- Large Graphical Display with Backlight
- User-Friendly Interface:
 - One-Button Agent Select
 - One-Button Sample (Pump) Control
- Auto compensation for Temperature and Barometric Pressure
- Built-in Sampling Pump
- Gas Flow Sampling at 150 ml/min
- Manual and Automatic operation
- Internal Data Logging with Date and Time - 500 Samples
- Rechargeable Lithium-Ion Battery
- USB Computer Interface
- Field Upgradeable - Flash Memory
- Fast warmup time

STANDARD ACCESSORIES: (included with AA_8000)

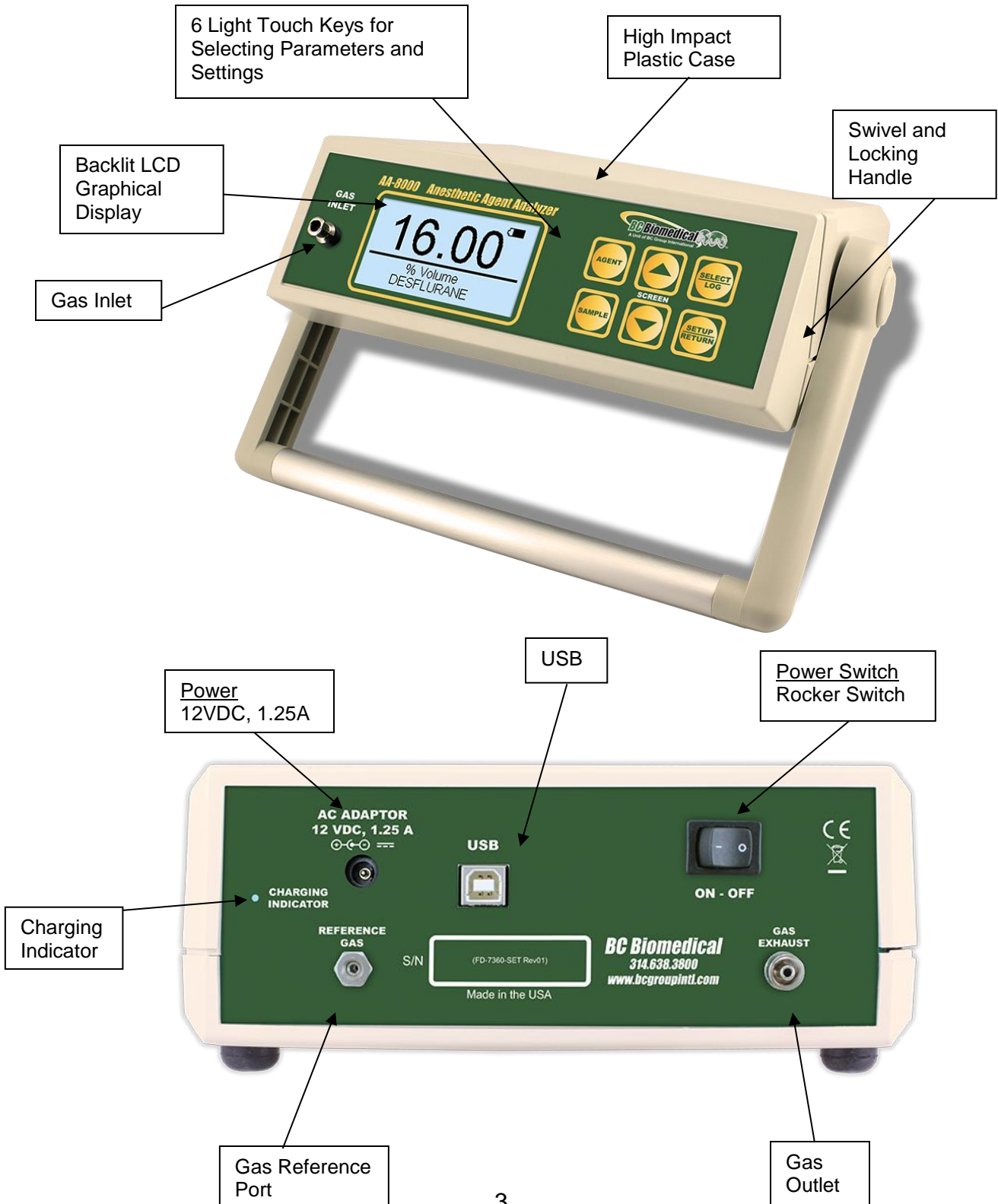
BC20-21112	Universal Power Adapter
BC20-43000	Sampling Line
BC20-43019	Sampling Tee
BC20-43021	Scavenger Tubing, 8 Feet
BC20-41352	USB Communication Cable (USB-A To USB-B)
BC20-30108	Soft Carrying Case

OPTIONAL ACCESSORIES (not included):

BC20-43022	F/AIR Charcoal Filter
KCG-1000	Calibration Gas, set of 3: Desflurane – 4% Isoflurane – 1% Sevoflurane – 1%

OVERVIEW

This section looks at the layout of the AA-8000 and gives descriptions of the elements that are present.



KEYS

Six tactile-touch keys are provided for system operation:



– This key is used to cycle through the 4 Agents.



– This key is used to Start and Stop the Sampling Pump.



– This key toggles the unit into and out of the Setup Mode. Depressing this key will enter the Setup screen where the configuration can be viewed and adjusted. Depressing the key again will exit the Setup Mode and Return to the previously viewed main screen.



– This key is used to select parameters on the screen or to save data to the log. The function of this key is dependent on the current screen. When on the Manual or Automatic Data Log screen, this key will save data to the data log. On all other screens, this key will function as a select key. Depressing the key once will cause an available parameter to be selected (highlight). Once selected, pressing this key again enters the edit mode. The cursor (highlight) will toggle on and off to indicate that the parameter is being edited.



- In the DISPLAY MODE, these keys scroll the display through the available main screens.



In the SETUP MODE,



- (a) These keys are first used to scroll through the available parameters.

The current parameter is highlighted.

- (b) Once the Select Key is depressed, the highlighting on the selected parameter toggles on and off to indicate that it is being edited. These keys are then used to scroll through the available values for that parameter.

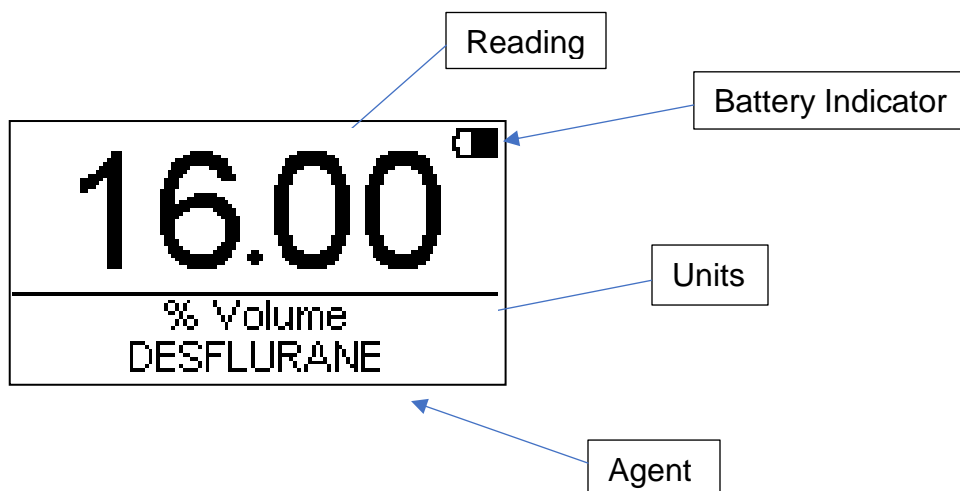
SCREENS


MAIN SCREENS – There are five main screens: Agent Measurement - Manual, Agent Measurement – Manual with Logging, Agent Measurement – Automatic with Logging, View Data Log, and Battery Indicator.

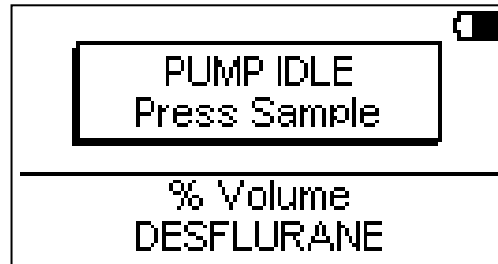
The available screens may be scrolled through using the   keys.

Not all screens need be displayed. In the Setup Mode, the user may modify the system to only use the desired screens. The minimum and simplest configuration only displays the Manual Agent Measurement and Battery Indicator Screens.

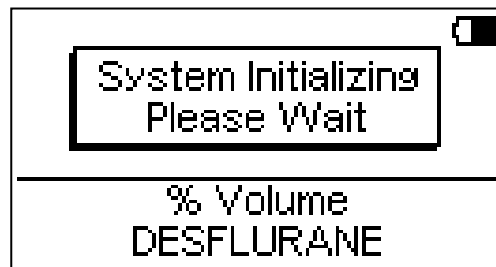
Agent Measurement – Manual – This is the primary screen for the unit and is designed to make the direct measurement of Agent concentrations as simple as possible. When first powered on, the unit will go through its initialization and then display this screen:





The reading will only be valid if the Sampling Pump is running. The pump is toggled on and off with the  key. When the pump is turned off, the following message will be shown indicating that the pump is off.

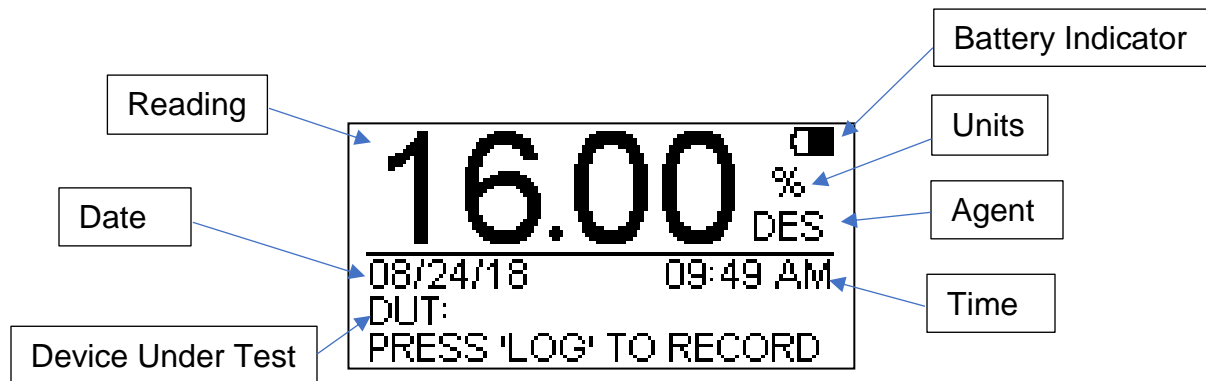


When the pump is turned on, the following message will blink to indicate that the pump is initializing:



The Agent is selected with the  key

Agent Measurement – Manual with Logging – If it is desirable to log readings, the Logging feature should be turned on in the Setup Parameters. If logging is turned on, depressing the  key from the main screen will display the following screen.



This screen provides all the features of the manual screen, in that the Agent may be selected and the Sample pump may be turned on and off.


Additionally, Pressing the Select/Log key will save the reading in the Manual Data Log.

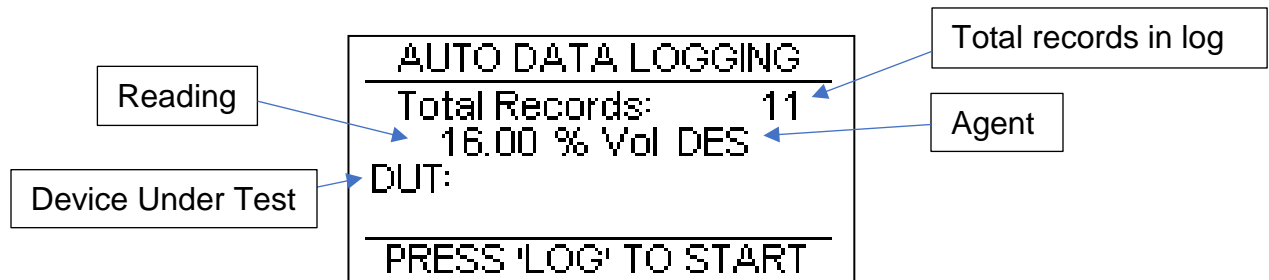
This entry consists of the Reading, Units, Agent, Date, Time and DUT value.

The Sample Pump must be running in order to save data to the log.


If it is desirable to pair the reading to a specific device, a unique identifier may be selected in the Setup Mode. The DUT identifier will be displayed on the screen and stored in the log.

Note the DUT value may be selected from a list of up to 10 values that have been stored in the unit via a computer download.

Agent Measurement – Automatic with Logging – If it is desirable to automatically log readings, the Auto Logging feature should be turned on in the Setup Parameters. If Auto Logging is turned on, depressing the  key from the Manual Log screen will display the following screen.



In this screen the agent can be selected and the total number of records are shown along with the agent and measurement. The instructions at the bottom of the screen indicate that the auto logging function is not running.

Pressing the  key will start the auto logging function. The display will change to the following to indicate the time before the next sample or the duration of the sample.

```

AUTO DATA LOGGING
-----
Total Records:    11
 16.00 % Vol DES
DUT:
NEXT SAMPLE:    5MIN
-----
PRESS 'LOG' TO PAUSE
    
```

```

AUTO DATA LOGGING
-----
Total Records:    11
 16.00 % Vol DES
DUT:
SAMPLING:    17SEC
-----
PRESS 'LOG' TO PAUSE
    
```

The sample interval and duration can be configured in the setup menu.

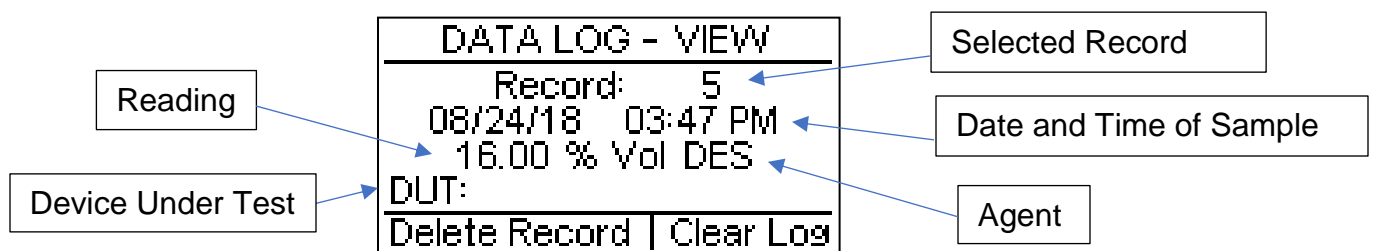
If it is desirable to identify the reading to a specific device, a unique identifier may be selected in the Setup Mode. The DUT identifier will be displayed on the screen and stored in the log.




Note the DUT value may be selected from a list of up to 10 values that have been stored in the unit via a computer download.


View Data Log – If it is desirable to view the Data Log readings, the View Log feature should be turned on in the Setup Parameters. If View Log is turned on, depressing the



key from the Auto Log screen will display the following screen.

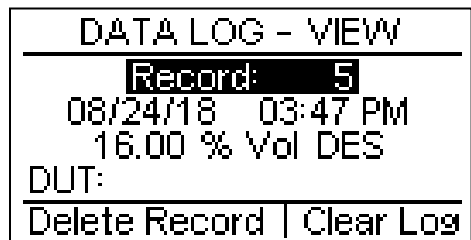






Pressing the  key will enter the select mode. While in select mode, the selection can be changed with the   keys.

To exit the select mode, press the  key.

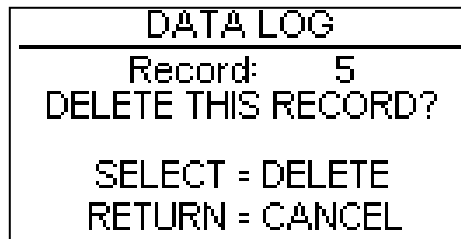
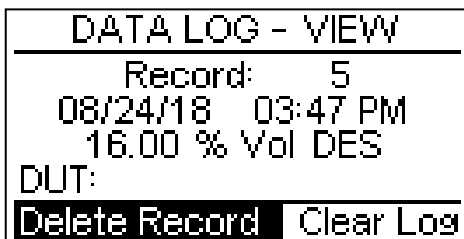
To activate the selection, press the  key while the desired selection is highlighted.



To select a specific record, press the  key to enter the select mode. The screen will change to the following.



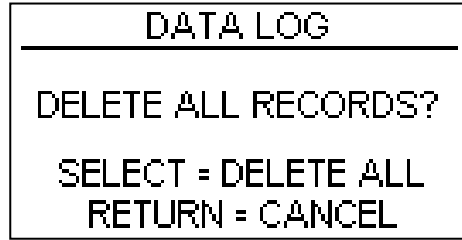
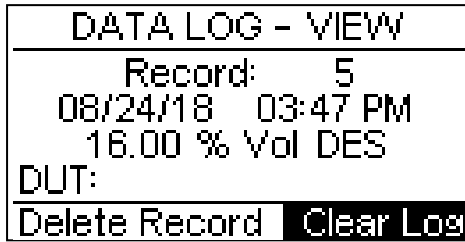
With the Record parameter highlighted, press the  key again to enter the Edit mode. The highlighted parameter will blink to indicate that it is in the Edit mode. Then the   keys can be used to view the desired Data Log record. To exit the Edit mode, press the  key.


To delete individual records, select the desired record to be deleted using the steps listed above and then highlight the Delete Record parameter.





With the Delete Record parameter highlighted, press the  key to delete the record. Note that the delete function must be acknowledged by pressing the  key a second time.

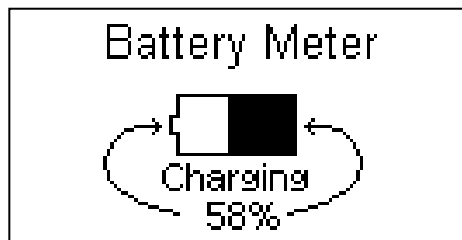
To delete the entire data log, use the arrows to highlight the Clear Log parameter.











With the Clear Log parameter highlighted, press the  key. Note that the delete

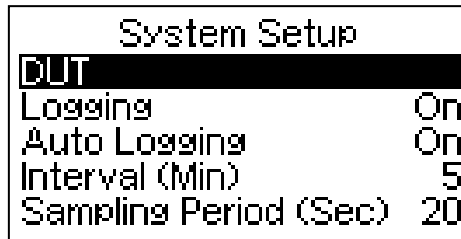
function must be acknowledged by pressing the  key a second time.

Battery Indicator– The battery indicator screen provides details on the status of the battery. To view the battery indicator, press the  key from the Data Log View screen. Batteries charge from the provided AC power adapter. While the batteries are charging, the display will flash “charging.” Note that there is some hysteresis in the battery charging. For example, if the battery is at 95% and the AC power adapter is plugged in, the batteries may not charge right away, allowing the batteries to discharge to 90% before charging.



SETUP

The Setup Mode allows the user to adjust the configuration of the unit. The Setup screen may be entered using the  key. Scroll through the parameters by using the   and then press the  key to select the parameter for change. The highlighting on the selected parameter will blink to indicate that the parameter is in the edit mode. The   keys can then be used to adjust the parameter setting. The edit mode may be exited using the  key. The  key is used a second time to exit the Setup Mode.




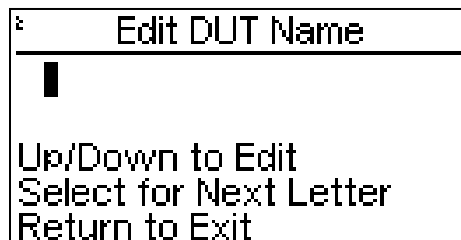
The following is a breakdown of the parameters available in the configuration of the unit and their available options:





System Setup Configuration		
Parameter	Description	Range
DUT:	Device Under Test (15 Characters)	xxxxxxxxxxxxxxxx
Logging	Logging (View Manual Log Input Screen)	On or Off
Auto Logging	Automatic Logging (Only if Logging is On)	On or Off
Interval	Minutes Between Samples (Only if Auto Logging is On)	1 - 99 Minutes
Sampling Period	Sampling Period (Only if Auto Logging is On)	5 to 99 Seconds

View Log	View Data Log Screen (Only if Logging is On)	On or Off
Date Format	Date Format	dd:mm:yy or mm:dd:yy
Year	Calendar Year	18 to 99
Month	Calendar Month	1 to 12
Day	Calendar Day	1 to 31
Time Format	Time Format	12 Hr or 24 Hr
Hour	Hour (Dependent on Time Format)	0 to 12 / 0 to 24
AM/PM	AM/PM (Only for 12 Hr Time Format)	AM or PM
Min	Minute	0 to 59
Auto Off Timer	Determines the period of inactivity before the unit is turned OFF. An interval timer is started when the unit is turned ON, reset each time a key is pressed, and paused when the Sample pump is running. When the timer reaches the value set in this parameter, the unit is Automatically put in Standby Mode. The main power switch must be cycled to turn the unit back on. (NOTE: Setting this parameter to 0 disables the Auto Off timer. When running from line power, the unit does not automatically enter standby mode.)	0-30 Minutes
Contrast Adjust	Sets the contrast of the display screen.	0-20
Backlight	Off – Always off 1-30 sec – The elapsed time after which the backlight will automatically turn off. ON – Always ON. (The Default setting is 30 seconds.)	Off, 1-30 sec, ON
Battery Life	Displays current life of the battery. At 10%, a warning screen will appear. At 0%, the unit will power down automatically.	0-100% (Read Only)
Access Code	Access Code for Setup (0 disables Access Code)	0 to 9999
Software	Displays current software program.	(Read Only)

EDIT DUT NAME

The Device Under Test (DUT) names can be edited either from the keys on the front of the unit or with the AA Companion software program. To use the keys first enter the Setup menu and select the DUT name parameter. Then press the  key. The following screen will be shown.



While in this screen, the   keys are used to edit the selected letter, the  key is used to change which letter is selected, and the  is used to save the changes to the DUT Name.

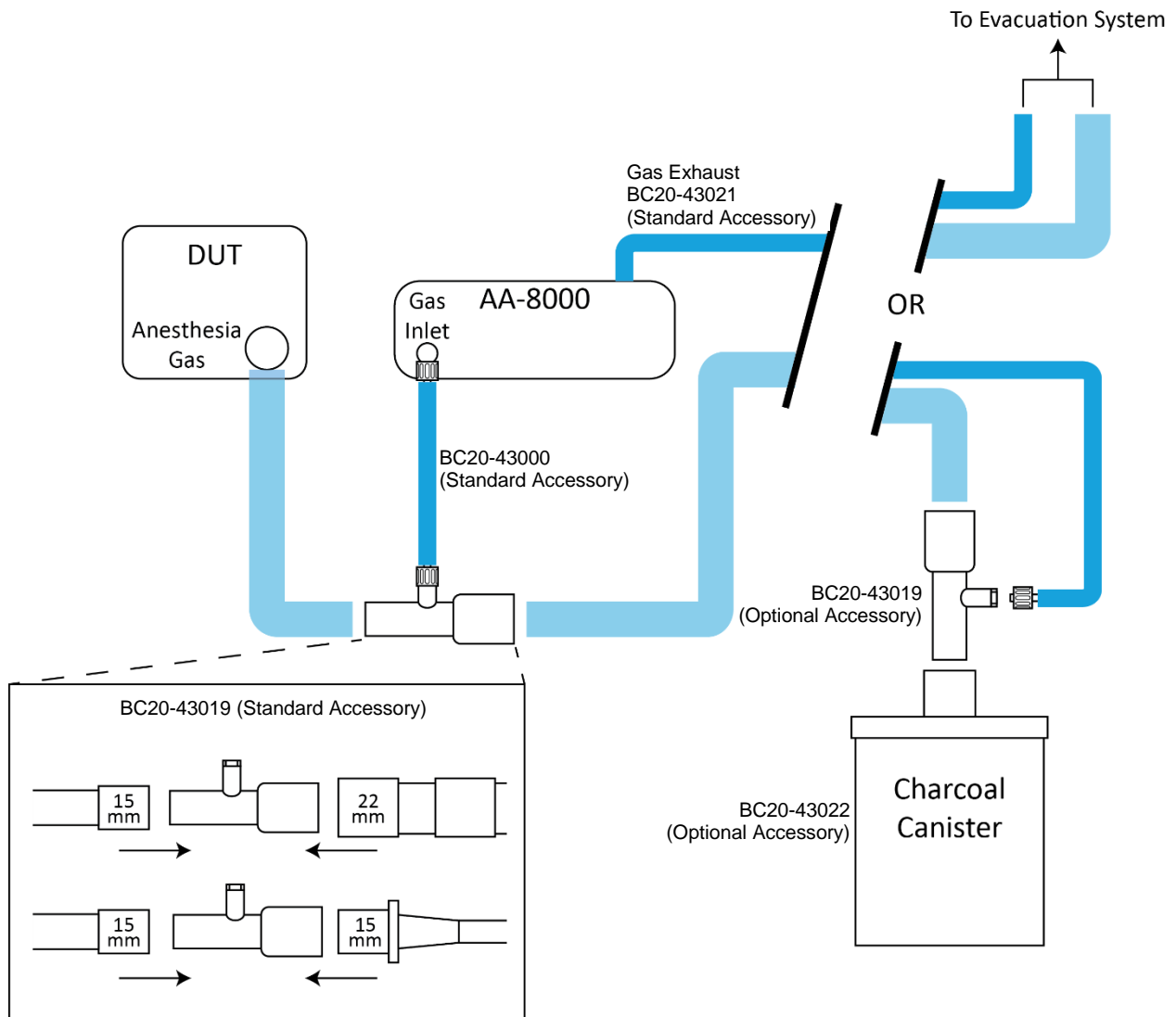
AA Companion is a PC based program that can interface with the AA-8000 via the USB port to quickly modify DUT names. This program can be downloaded from the BC Group website using the following link:

http://www.bcgroupestore.com/Biomedical-BC_Biomedical_AA-8000.aspx

At the bottom of the website listed above, there is a tab labeled “More Details”. This tab contains a link to download to the AA Companion software.

CONNECTIONS

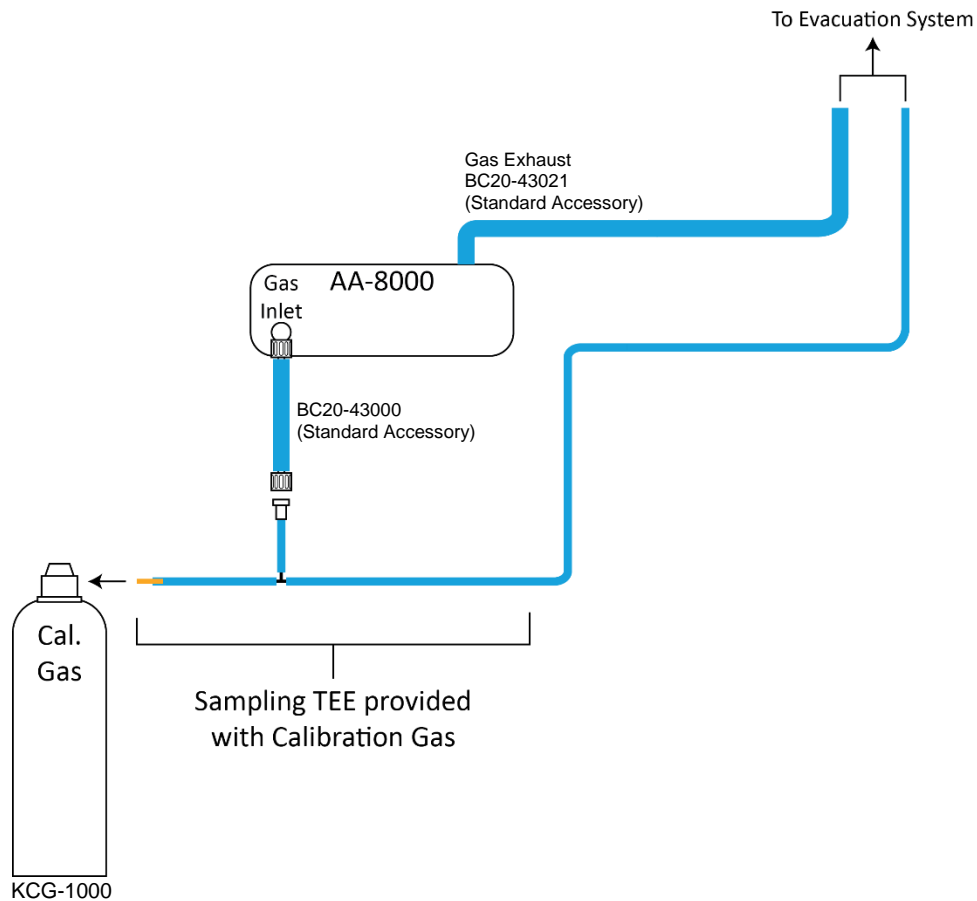
It is recommended that the exhaust port be connected to a gas reclamation system or a charcoal filter to ensure that the anesthetic agent is not released into the ambient air, especially when working in confined areas. Do not make any connections to the reference port.



CALIBRATION

BC Group recommends a 12 point calibration at our factory at least every 12 months. This method tests three points over the range for each agent, but we also offer a 4 point calibration for customers who only want us to test one point for each agent. We use a laser refractometer as a calibration standard which provides higher accuracy compared to using bottled calibration gases,. Our calibrations are performed by factory trained technicians in a controlled environment and we document the results of our tests. We also provide a NIST traceable calibration certificate with every calibration. Customers may also perform a calibration verification in the field using calibration gases, which BC Group offers (Part Number KCG-1000), but this only tests one point per agent and does not offer the benefits listed above for factory calibration.

To perform a field calibration verification using the KCG-1000 calibration gases, connect the system according to the diagram below.



NOTE: A charcoal canister does not filter N₂O and is not suitable for use with the KCG-1000 calibration gases.

With the connections made as shown above, press on the calibration gas dispense nozzle to release the gas and perform a measurement. The reading on the AA-8000 must fall within the limits shown in Table 1 below.

KCG-1000 Calibration Gas	Nominal Concentration	Valid AA-8000 Measurement
Desflurane	4%	3.79 to 4.21
Isoflurane	1%	0.91 to 1.09
Sevoflurane	1%	0.91 to 1.09

Table 1 – Field Calibration Verification Limits

COMMUNICATION PROTOCOL

The communication protocol provides a means to completely configure and use the AA-8000 from a PC. All of the functions available through the front panel can be performed through the communication. All of the measurements made by the AA-8000 are accessible as well. This provides for hands free or automated operation of the AA-8000.

Communication Port

The AA-8000 has a USB port that when connected to the PC shows up as a virtual serial port. The Serial port is configured as 115,200 Baud Rate, 8 Data Bits, 1 Stop Bit, and No Parity.

Command Syntax (SCPI)

The command description is broken into 3 columns; the KEYWORD, the PARAMETER FORM and COMMENTS.

Keyword

The KEYWORD column provides the name of the command. The actual name of the command consists of one or more keywords since SCPI commands are based on a hierarchical structure, also known as a **tree system**.

In such a system, associated commands are grouped together under a common node in the hierarchy, analogous to the way leaves at a same level are connected at a common branch. This and similar branches are connected to fewer and thicker branches, until they meet at the root of the tree. The closer to the root, the higher a node is considered in the hierarchy. To activate a particular command, the full path to it must be specified.

This path is represented in the following tables by placing the highest node in the left-most position. Further nodes are indented one position to the right, below the parent node.

The highest level node of a command is called the Keyword, followed by the Node and then the value.

Not all commands require the complexity of the full command path. For example, the Status? command doesn't have a Node or Subnode.

Some commands allow for reading and writing data and some commands are Read Only. To indicate a read function, a question mark (?) is placed at the end of the command path. For example, a write command to change auto data log interval to 10 minutes would be "SYSTem:INTerval 10<cr>", where <cr> indicates a carriage-return. An example command to read the measured agent concentration would be "READ:MEAS?<cr>", which would return a value of "xx.xx<cr><lf>" where <cr> is a carriage-return and <lf> is a linefeed.

Lowercase letters indicate the **long-form** of the command (for example, **CONFigure:AGENT ISOflurane**) and can be omitted for simplification. Uppercase letters indicate the abbreviated, or **short-form**, of the commands and must be included (for example, **CONF:AGENT ISO**).

All commands sent to the unit are terminated with a Carriage Return.

NOTE: Commands sent to the AA-8000 are not case sensitive. Upper and lower cases are only used when documenting the commands.

Parameter Form

The PARAMETER FORM column indicates the number and order of parameters in a command and their legal values. Parameter formats are listed in angle brackets (<>) while string parameters are simply listed.

Square brackets [] are used to enclose one or more parameters that are optional.

The vertical bar | can be read as "or" and is used to separate alternative parameter options.

The query form of a command is generated by appending a question mark (?) to the last keyword. However, not all commands have a query form, and some commands exist only in the query form. The COMMENTS column is used to indicate this.

Comments

The COMMENTS column indicates any notes.

CONFigure Subsystem

This group allows the user to setup the display and operational settings for the unit.

KEYWORD	PARAMETER FORM	COMMENTS
CONFigure :AGENT	ISOflurane DESflurane SEVOflurane HALOthane	Selects the desired agent to be measured
:MODE	MANual MLOG ALOG VLOG BATTery	Used to select or read which screen is displayed

DATAlog Subsystem

This group allows the user to configure the datalog or retrieve datalog records.

DATAlog :NUMrecords?		0-500, Read Only
:RECORD<n>?		Returns Record <n>, Read Only Omit <n> to read last record
:ERASElog		Write Only, deletes all records stored in datalog
:DELrecord<n>		Write Only, Deletes record <n>

READ Subsystem

This group allows the user to get measurements from the unit.

KEYWORD	PARAMETER FORM	COMMENTS
READ: :MEAS?		Gas Measurement - Read Only
:AGENT?		Selected Agent - Read Only
:TIME?		Current Time – Read Only
:DATE?		Current Date – Read Only

SYSTEM Subsystem

This group allows the user to setup the unit, as well as directly control the unit, as if pressing the keys on the front panel.

KEYWORD	PARAMETER FORM	COMMENTS
SYSTem:		
:DUT?		Read Only
:DUT <n>		<n> is from 1-10
:DUT <n>,ssss		<n> is from 1-10 ssss is 15 chars max
:LOGenable	ON OFF	Enable/Disable Datalog
:ALOGenable	ON OFF	Enable/Disable Auto Log
:INTERval	1-99 (minutes)	Auto Log Interval time
:PERiod	5-99 (seconds)	Auto Log Sample Period
:VLOG	ON OFF	Enable/Disable Datalog View
:DFORmat	DDMMYY MMDDYY	Date Format
:YEAR	0-99	Current Year
:MONTH	1-12	Current Month
:DAY	1-31	Current Day of Month
:TFORmat	12 24	12 or 24hr Time Format
:HOUR	1-12, 0-23 (Depending on format)	Current Hours
:MINute	0-59	Current Minutes
:AOFF	0-30	Auto Off Timer (minutes)
:CONtrast	0-20	Contrast Adjustment
:BACKlight	OFF 1-30 ON	Backlight Control
:BATTery?	0-100	Read Only
:KEY	AGEnt SAMple UP DOWN SElect LOG SETup RETurn	Simulate Key Press
:VERsion?		Read Only

STATus Sub-system

This subsystem provides status on the operating mode of the unit including messages that would normally be seen on the display.

KEYWORD

PARAMETER FORM

COMMENTS

STATus?

Bit	Value	Definition
0	1	Auto Datalog Paused
1	2	Auto Datalog Sampling
2	4	Auto Datalog Active
3	8	System Initializing
4	16	Occlusion Detected
5	32	
6	64	
7	128	Sample Pump Running
8	256	
9	512	
10	1024	
11	2048	
12	4096	
13	8192	
14	16384	
15	32768	

Read Only

AA-8000 Communication Command Summary

Keywords	Nodes	Values
CONFigure	AGENT	ISOflurane, DESflurane, SEVOflurane, HALOthane
	MODE	MANual,MLOG,ALOG,VLOG,BATTery
DATAlog	NUMrecords?	0-500 [read only]
	RECOrd <n>?	Returns Record <n>, Omit <n> to read last record [read only]
	ERAselog	
	DELrecord <n>	Deletes Record <n>
READ	MEAS?	Returns: Agent Concentration [read only]
	AGENT?	Returns: Selected Agent [read only]
	TIME?	Returns: Current time [read only]
	DATE?	Returns: Current Date [read only]
SYSTEM	DUT?	[read only] returns the currently selected DUT name.
	DUT <n>	Select DUT name from list where n is the string number 1-10
	DUT <n>,ssss	Program DUT string where n is string number 1-10, ssss is 15 characters max
	LOGenable	ON, OFF
	ALOGenable	ON, OFF
	INTerval	1-99 (minutes)
	PERiod	5-99 (seconds)
	VLOG	ON,OFF
	DFORmat	DDMMYY,MMDDYY
	YEAR	0-99
	MONTH	1-12
	DAY	1-31
	TFORmat	12, 24
	HOUR	1-12, 0-23 (depending on time format)
	AMPM	AM, PM (only for 12 hr time format)
	MINute	0-59
	AOFF	0-30
	CONtrast	0-20
	BACKlight	OFF,1-30, ON
	BATTery?	0-100 [read only]
	KEY	AGENT,SAMPLE,UP, DOWN, SELECT, LOG, SETUP, RETURN
	VERsion?	[read only]

STATus?	Bit	Value	Definition
	0	1	Auto Datalog Paused
	1	2	Auto Datalog Sampling
	2	4	Auto Datalog Active
	3	8	System Initializing
	4	16	Occlusion Detected
	5	32	
	6	64	
	7	128	Sample Pump Running
	8	256	
	9	512	
	10	1024	
	11	2048	
	12	4096	
	13	8192	
	14	16384	
15	32768		

MANUAL REVISIONS

<u>Revision #</u>	<u>Program #</u>	<u>Revisions Made</u>
Rev 01	DT7360CA	Origination
Rev 02	DT7360CB	Remote Control Protocol

LIMITED WARRANTY

WARRANTY: BC GROUP INTERNATIONAL, INC. WARRANTS ITS NEW PRODUCTS TO BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP UNDER THE SERVICE FOR WHICH THEY ARE INTENDED. THIS WARRANTY IS EFFECTIVE FOR TWELVE MONTHS FROM THE DATE OF SHIPMENT.


EXCLUSIONS: THIS WARRANTY IS **IN LIEU OF** ANY OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF **MERCHANTABILITY** OR FITNESS FOR A PARTICULAR PURPOSE.

BC GROUP INTERNATIONAL, INC. IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO PERSON OTHER THAN AN OFFICER IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR ASSUME ANY LIABILITY.

SPECIFICATIONS

GENERAL	
Model	AA-8000 Anesthetic Agent Analyzer
Measurement Technology	NDIR (Non-Dispersive Infrared)
Gases	Sevoflurane, Isoflurane, Desflurane and Halothane
Accuracy	+/- (0.05% Vol% + 4% relative)
Range (Iso, Sevo and Halo)	0 to 8.00%
Range (Des)	0 to 20.00%
Resolution	0.01%
Detection Minimum	0.15%
Sampling Method	Suction Pump (internal)
Sampling Rate	150 mL/min
Internal Memory	Flash
Interface	USB Device

ELECTRICAL	
AC POWER	90 to 275 VAC, 50/60 Hz
AC POWER ADAPTER	12 VDC, 1.25 A  BC20-21112 (Universal)
BATTERY	Internal Rechargeable Li-Ion battery pack
BATTERY RUNTIME	12 Hours Continuous

PHYSICAL & ENVIRONMENTAL		
DISPLAY	128 X 64 Pixels Graphical LCD, White LED Backlight	
SIZE	7.9 x 6.8 x 3.0 Inches (200 x 173 x 76 mm)	
WEIGHT	< 3.5 Lbs. (1.6 kg)	
CONSTRUCTION	ENCLOSURE	ABS Plastic
	OVERLAY	Back-Printed Lexan
OPERATING RANGE	15 to 40 °C (59 to 104 °F)	
OPERATING ALTITUDE	Up to 10,000 ft	
OPERATING PRESSURE (AMBIENT)	660 -1200 mBar	
STORAGE RANGE	-20 to 60 °C (-4 to 140 °F)	

NOTES

NOTES



**BC GROUP INTERNATIONAL, INC.
3081 ELM POINT INDUSTRIAL DRIVE
ST. CHARLES, MO 63301
USA**

1-800-242-8428

1-314-638-3800

www.bcgrouptl.com
sales@bcgrouptl.com

**AA-8000 User Manual
10/18 – Rev 2**

**Copyright © 2018
Made in the USA**