

Section 2: Using the Invasive Blood Pressure Module - An Introduction

IBP Module - General

The Invasive Blood Pressure module is a dual function module that can monitor pulsatile pressure waves such as an arterial pressure wave or static pressure values such as central venous pressure or urinary bladder pressures. The IBP module uses connectors compatible with the DPT-200/DPT-400 disposable transducers manufactured by Utah Medical. However the actual IBP module will work with any Blood Pressure Module conforming to the uniform standard for Blood Pressure Transducers. In part the standard encompasses the following:

Excitation +/- 5v to +/- 10v

Output 5uV/V/mm Hg

Connections: +5v, -5v, Sig+, Sig-.

The DPT-200 and the DPT-400 transducers are identical in form and function. The DPT-200 transducer is suitable for intra-arterial blood pressure monitoring. For static pressure monitoring the DPT-X00 is required.

The Sentinel Monitor may be fitted with one or two channels of invasive blood pressure monitor, called IBP1 and IBP2. Each channel behaves in the same manner and transducers are inter-changeable between channels. The settings for each channel are independent so it is possible to have differing alarm rates on each IBP channel, without any cross-interference. In the following description the Invasive Blood Pressure channel is referred to as IBP1. All comments and descriptions relating to IBP1 apply to channel IBP2.

Changing between Pulse and Static Mode

To change the mode of pressure monitoring touch the screen anywhere in the trace region and select the "SETUP" option. The current IBP mode is indicated by the third button down on the right, e.g. IBP1: PULSE. Pressing this button will toggle the mode between "PULSE" and "STATIC". Select whichever option you require and then press "EXIT" to quit the menu and save your changes.

Zero-ing the IBP monitor

Once the transducer has been attached to the cable and that in turn attached to the VitalStore Monitor, it should be placed at the level of the heart of the patient to be monitored and then zeroed. To zero the IBP1 input, the trace for IBP1 must be showing on the screen. If it is minimised, touch the IBP1 numerical data region at the bottom of the screen and then touch "ADD TRACE". Touch the IBP1 trace region to bring up the trace options for IBP1. The IBP1 ZERO button is immediately above the "SETUP" button. If the blood pressure transducer is not connected, or not recognised the button will say IBP1 ERROR. If the transducer is connected and recognised, the button will say "IBP1 ZERO". Pressing the IBP1 ZERO button will zero the IBP trace to the current pressure input.

A zero value needs to be obtained when monitoring in pulse or static mode.

Arterial Blood Pressure Monitoring

The DPT-200 IBP transducer is connected via an extension cable to the VitalStore Monitor through the 8-way connector on the lower right hand side of the monitor. The DPT-200 transducer is a 3cc/hour constant flow transducer that requires the incoming line of fluid to have a pressure that exceeds the pressure of the input side. This is normally most easily achieved by having the fluid bag held within an inflatable cuff that can be inflated to pressures of 300mmHg for arterial blood pressure monitoring.

Connect the transducer, ensure the fluid from the fluid reservoir is flowing through the transducer by pulling on the small tab and then zero the instrument.

The input side of the transducer can now be connected to the patient arterial line. A pulse waveform will now be visible on the IBP1 trace. This waveform can be adjusted via the trace options menu that is shown when the IBP1 trace is touched. The trace menu options for IBP1 are:

INCR GAIN: Increases the size of the Pressure Trace on the screen.

DECR GAIN: Decreases the size of the Pressure Trace on the screen.

SHIFT UP: Shifts the Pressure Trace up the screen

SHIFT DOWN: Shifts the Pressure Trace down the screen

INCR SPEED: Increases the sweep speed of the trace across the screen

DECR SPEED: Decreases the sweep speed of the trace across the screen

IBP1: ZERO or IBP1: ERROR - see "Zero-ing the IBP monitor" above

REMOVE TRACE: Removes the trace window from the screen and places the numerical data region at the bottom of the screen.

SETUP: Enters the general setup features for the unit

EXIT: Exits the menu, saving any changes that have been made

Viewing the IBP values

The numerical data region to the right hand side of the IBP1 trace region has four fields.

The top field in large figures is for the Systolic Pressure. The field immediately below this in slightly smaller figures is the Mean Arterial Pressure and the field immediately below this is the Diastolic pressure field. The field to the right of the pressure measurements is the heart rate as shown by the legend "HR" and gives the measured heart rate in beats per minute.

Setting the IBP Alarm Limits

The IBP1 alarm limits can be set by touching the IBP1 numerical data region to bring up the ALARM SETUP menu for IBP. There are 4 settable alarm limits:

High Heart Rate in bpm

Low Heart Rate in bpm

High Systolic Pressure in mmHg

Low Systolic Pressure in mmHg

Change the values of any of these options by pressing the associated UP or DOWN button. Then change the status of the alarm to ENABLED by toggling the DISABLED/ENABLED button. Press EXIT when done. The alarm options are then saved to non-volatile memory and will be remembered after a power-down.

The measurement data from the Sentinel Monitor can be sent to the PC using the USB 2.0 cable supplied. When a PC is connected to the Sentinel Monitor the upper status line will show: CABLE: PC CONNECT. This changeover to PC CONNECT status is automatic and will be retained after a power-down.

Central Venous Line Monitoring

To monitor a central venous line or other non-pulsatile pressure line, use the STATIC mode of the IBP module. In this mode the reported value on the screen is an instantaneous value of the pressure being measured. No averaging of this data is applied and no interpretation of the waveform is attempted, so there are no resulting peak and trough values reported. For lines requiring peak and trough values use the PULSE mode of the IBP module. The PULSE mode has an adaptive algorithm that will work on peak to trough differences down to 10mmHg. i.e. for the PULSE algorithm to function the peak value must be at least 10mmHg greater than the trough value. Whilst monitoring in STATIC mode, measured data can still be sent to the PC, where it too can be viewed in either PULSE or STATIC mode.

Specifications

Oscillometric (NIBP) Module

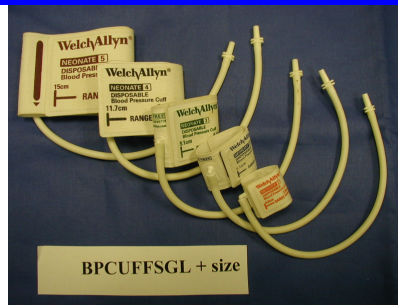
Method of measurement:	Oscillometric. Diastolic values correspond to Phase 5 Korotkoff sounds
Blood Pressure Range:	Systolic: 40 – 265 mmHg MAP: 27-222mmHg Diastolic: 20 – 200 mmHg
Pulse Rate Range:	25 – 300 BPM (Beats per minute)
Cuff Deflate Rate:	Deflation step size varies with heart rate, cuff pressure and cuff volume
Initial Inflation Pressure:	Cuff size 1-3: 160mmHg Cuff size 4+: 160mmHg
Clinical Accuracy:	The Veterinary algorithm is based on the human algorithm that meets accuracy requirements of ANSI/AAMI SP10:1992 and 2002
Pressure Transducer Accuracy	+/- 3mmHg between 0 mmHg and 300 mmHg for operating conditions between 0°C and 50°C
Operating Conditions:	0C to 50C, 15% to 95% non-condensing humidity
Storage conditions:	-20C to 65C, 15% to 95% non-condensing humidity
Altitude:	Measurement accuracy is not affected by altitude
Startup Initialisation period:	7 seconds
Patient Safety:	Internal operating software ensures that: • Maximum cuff inflation time is limited to 75 seconds • Duration of blood pressure reading is limited to 120 seconds Additional redundant safety circuitry oversees normal operation and will override to abort a reading if:- • Cuff pressure exceeds 300mmHg at anytime • The cuff has been inflated for 180 seconds

Extras for your Sentinel Blood Pressure Monitor

Consumables

Part Number: BPCUFFSGL+ size

Description: Blood Pressure Cuff –
Single Hose available in sizes, 1, 2, 3, 4,
and 5



For other products and consumables see our web page:
<http://www.vetronic.co.uk>