

# ARROW® Intra-Aortic Balloon Troubleshooting

## TRIGGERING

In order to have consistent and effective pumping, a reliable physiological signal (trigger) is required to initiate an inflate/deflate cycle. A consistent assist marker verifies reliable trigger recognition by the pump.

ECG is the preferred trigger and is the most reliable in general.

1. Select a lead that gives the largest R wave and minimizes the P and T waves.
2. Avoid biphasic QRS complexes. The pump may not consistently recognize its trigger point because there are two slopes to analyze. This could cause wandering timing or skipped beats.
3. Ensure ECG gain is adjusted so that the R wave is tall enough to be seen by the trigger algorithm and not so high that the pump is triggering on the P or T waves also.
4. Regular rhythms should produce regular pumping. Artifact may cause double triggering or trigger loss.

## TRIGGER LOSS ALARM

1. Trigger signal not present or not recognizable:
  - a. Check ECG source and AP source.
  - b. Check ECG gain.
  - c. Change trigger mode.

## WANDERING TIMING

1. If irregular rhythm present recommend using AFIB trigger for ACA1<sup>®</sup>1 PLUS and KAAT II PLUS<sup>®</sup>, ECG with arrhythmia timing for AutoCAT<sup>™</sup>, or R-Wave with arrhythmia timing for TransAct<sup>®</sup>.
2. If a regular rhythm is present, the pump is not seeing a consistent trigger signal.
  - a. Check the ECG gain.
  - b. Change ECG lead.
  - c. Change trigger mode.

## BALLOON PRESSURE WAVEFORM

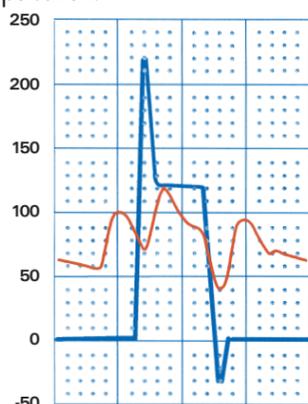
The Balloon Pressure Waveform (BPW) represents helium movement to and from the console and the IAB catheter. It is a calibrated waveform, which allows objective assessment of the safety and effectiveness of counterpulsation.

### BPW HEIGHT

Reflects the pressure in the aorta, therefore the plateau pressure on the BPW should be within  $\pm 25$ mmHg of the Peak Diastolic Pressure.

### BPW WIDTH

Is approximately the duration in which the balloon is inflated.

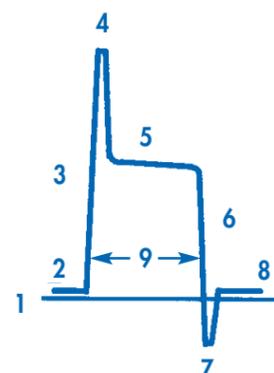


## POOR AUGMENTATION

1. Patient's stroke volume is greater than the balloon volume. Prophylactic insertion. Patient may be ready to wean from pump.
2. Balloon too small related to patient's aortic environment. Check balloon pressure waveform's plateau pressure.
3. Low SVR.
4. Hypovolemia.
5. Hypertension.
6. Balloon positioned too low.
7. Late inflation.
8. Partial obstruction of gas lumen, particularly if in conjunction with wide inflation artifact on balloon pressure waveform.



1. Zero Baseline.
2. Balloon Pressure Baseline.
3. Rapid Inflation.
4. Peak Inflation Artifact.
5. Plateau Pressure.
6. Rapid Deflation.
7. Deflation Artifact.
8. Return to Baseline.
9. Duration of Balloon Cycle.



## ABNORMAL BPW / ALARMS

### Wide Inflation and/or Deflation Artifact

Indicates a partial obstruction to the gas lumen of the balloon. May result in poor augmentation and/or poor afterload reduction. May lead to gas loss alarms in higher heart rates when in 1:1 assist ratio.

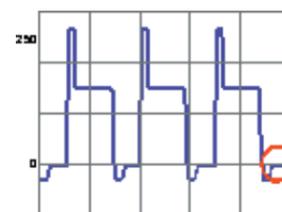


### Helium Loss / Gas Loss / Gas Leakage Alarm

Not all of the gas that went out to the balloon came back to the pump.

1. Observe for blood in tubing. If present, leave pump off, clamp tubing, notify physician to remove catheter.
2. Check connections.
3. Check for kinks.

Note: baseline slightly in negative.

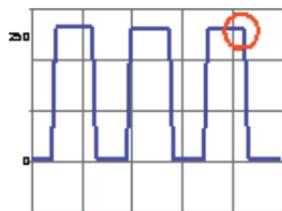


### High Pressure / Kinked Line Alarm

Generally due to kinked catheter, either internal or external.

1. Reposition patient. Keep affected leg straight. Use rolled towel under affected hip to hyperextend hip.
2. Apply slight traction to catheter.
3. Check placement of balloon, may be too high or low.
4. IAB may be too large for patient.
  - a. Recommended to not reduce volume below 2/3.

Note: square or rounded plateau pressure.

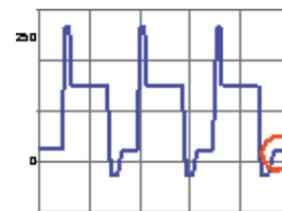


### High Baseline / Fill Pressure Alarm

Indicates too much gas in system.

1. Check for intermittent obstruction of gas lumen.
2. Overfill.

Note: baseline far above zero.



**24-Hour Intra-Aortic Balloon Product**  
**Support Hotline: 800-447-IABP**

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