



Your Trusted Partner in Research

# ADV550

**Pressure-Volume Loop Measurement System**

Unparalleled Analysis of Cardiovascular Function

# ADV550

**Transonic has a forty-year history** of creation and innovation. We pioneered Transit-time ultrasound flow measurement in 1983, and our progress has only accelerated since. In 2008, we launched our disruptive Admittance Pressure-Volume (PV) Loop technology which gained the confidence of hundreds of labs throughout the world. With Admittance we surpassed the well-known shortcomings of Conductance technology, delivering higher quality, reproducible data. Today we continue this history of innovation with the ADV550, the world's most evolved PV loop system.

## Designed with the End User in Mind

**The ADV550 delivers the data** Transonic is known for — true, real-time ventricular volume — without complicated calibration steps (saline bolus and cuvette). Designed to improve your workflow in both the training and data collection phases, the ADV550 incorporates a new digital color display with the Transonic ADVantage data collection process. ADVantage offers guided steps and a linear menu structure that encompass all aspects of data collection, bringing the benefits of Admittance-Derived-Volume to your studies in an intuitive, user-friendly design.

## PV Loop Data Collection with the Transonic ADVantage

- Prepare experiments with a catheter hydration clock
- Calibrate data acquisition for consistent recording and analysis
- Utilize automated pressure sensor balance
- Optimize catheter position with our new live volume feedback

## ADV550 Familiar Features

- Admittance technology, including feedback for total conductance, myocardial contribution, and calibrated ventricular volume
- Modular design: a single system for all animal models and catheter types
- Two catheter inputs to run PV and pressure catheters simultaneously or separately
- Open and flexible integration with your choice of data acquisition/analysis provider, including: ADInstruments, emka TECHNOLOGIES, iWorx, Ponemah®, Notocord™, BIOPAC® and others
- User-selectable catheter segment length to provide flexibility and value in large-animal protocols





# The ADV550 – a PV Loop System That Doesn't Miss a Beat

**Considering the practical challenges** of PV data collection, nothing is more important than catheter positioning inside the ventricle. Traditional conductance technologies lack positional feedback, and as a result, they limit insight into the resulting data.

**Admittance-Derived-Volume empowers users** with positional insight by reporting myocardial contribution in real-time. Combined with improved processing power, this allows the ADV550 to bring a new level of confidence to your data.

## Transonic ADVantage: Full Confidence Throughout Your Protocol

**With the ADV550**, users can optimize catheter positioning with live blood-volume feedback. This qualifies data integrity with real-time measures of stroke volume, cardiac output, and ejection fraction.

**Are you learning PV loops** or training a new lab member? Turnover in a lab is healthy, but it presents a challenge for specialized techniques like PV loop data collection. Real-time data feedback during catheterization dramatically shortens this learning curve.

## Scisense Catheters

**We have over 20-years experience** manufacturing Scisense Pressure and Pressure-Volume catheters, so we understand the importance of accurate, reliable lab tools. Our catheters feature solid-state pressure measurement technology — an industry standard of resolution in life sciences — and come in a wide range of sizes and options for any application. Our catalogue includes 1.2F (0.40mm), 1.9F (0.63mm), 3.5F (1.17mm), 5F (1.67mm) and 7F (2.33mm) options. All sizes and configurations are routinely deployed in both the left and right ventricle, via carotid, jugular, femoral, and apical access routes.

**A member of our team would be happy to review your application and determine the best model for your needs.**

1.2F  
(0.40 mm)

1.9F  
(0.63 mm)

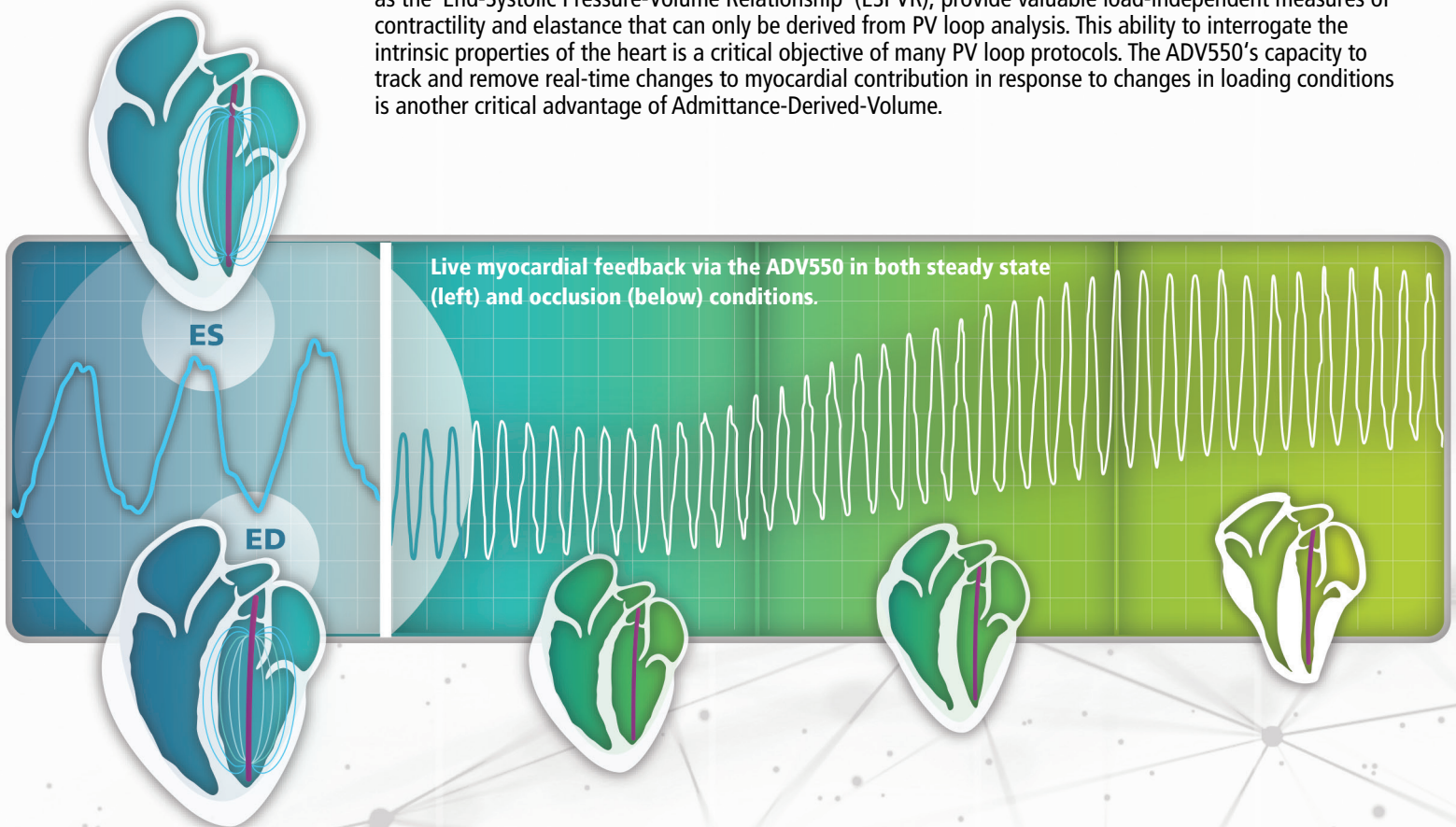
3.5F  
(1.17 mm)

5F  
(1.67 mm)

7F  
(2.33mm)

## The Heart is Dynamic; Your PV Loop System Should be Too

**Real-time measurement of myocardial contribution** allows us to provide positional feedback to the user, but it also results in more accurate data where it matters most. Complex PV relationships, such as the 'End-Systolic Pressure-Volume Relationship' (ESPVR), provide valuable load-independent measures of contractility and elastance that can only be derived from PV loop analysis. This ability to interrogate the intrinsic properties of the heart is a critical objective of many PV loop protocols. The ADV550's capacity to track and remove real-time changes to myocardial contribution in response to changes in loading conditions is another critical advantage of Admittance-Derived-Volume.



**The internal dimensions of the heart** are constantly changing through end-systole and end-diastole. As a result, the myocardial contribution to the received volume data increases and decreases through the entire cardiac cycle. These changes can be magnified by experimental protocols, such as loading changes via occlusion of the inferior vena cava (IVC).

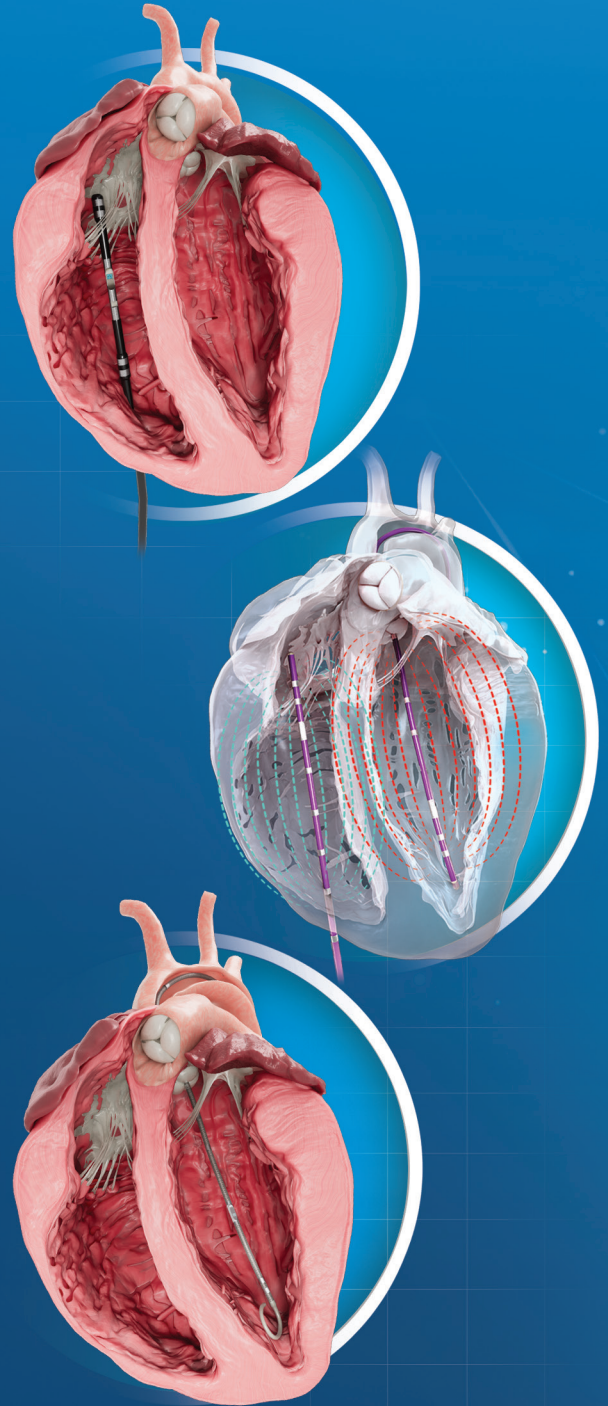
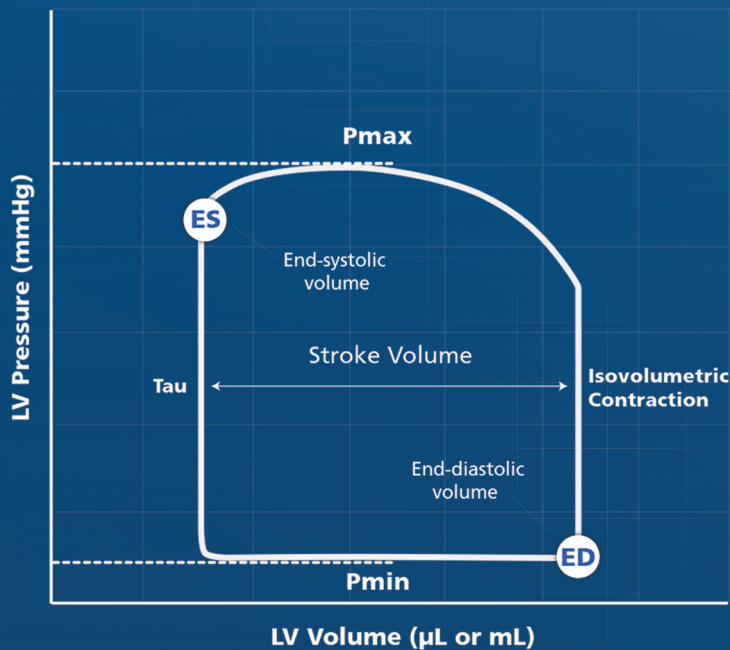
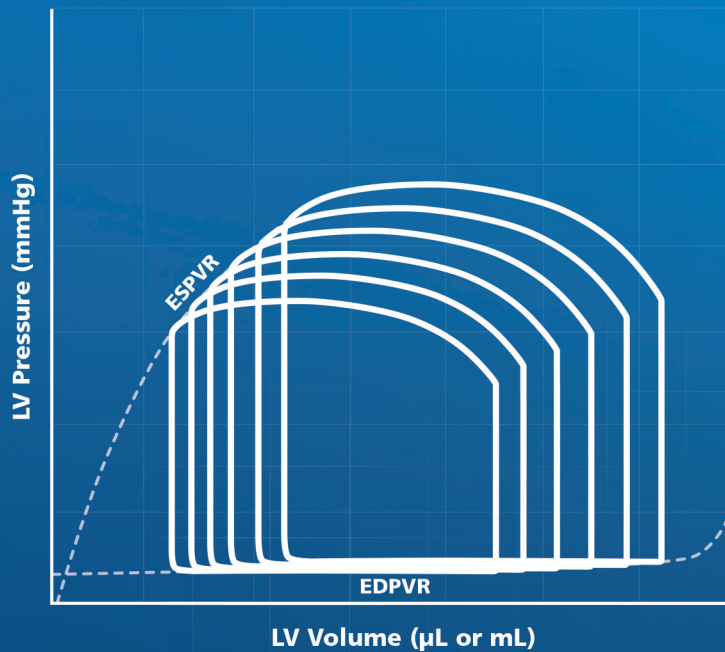
**Traditional conductance technologies** rely on a post-calibration technique using a saline bolus to determine an average measure of myocardial contribution. This calibration technique approximates the muscle's contribution under load-dependent conditions only, where the environment is relatively steady. As you can see in the image above, the myocardial contribution increases steadily throughout the entire IVC occlusion, which is what we would expect with less and less blood in the ventricle.

**Rather than relying on an assumption or average**, the ADV550 tracks and removes the beat-by-beat live measure of myocardial contribution to ensure that your ESPVR and other advanced derivatives of PV loop data are as physiologically accurate as possible.



## Why Study Pressure-Volume Loops?

**Ventricular pressure and volume** are essential parameters because they allow for the calculation of  $dp/dt$ , stroke volume, ejection fraction, cardiac output, etc. Each variable is important, but individually, they are incomplete. PV loops also provide a range of hemodynamic parameters which are otherwise not readily measurable. These include changes in contractility, elastance, power, energetics, and efficiency. By delivering both load-dependent and load-independent measures of contractility, PV loops provide the most comprehensive measurement of hemodynamics and cardiac function available today.



**Historically, PV loops were used predominantly** in left ventricular research, but right ventricular applications, such as studying pulmonary arterial hypertension, are on the rise. Recently, our equipment has also been used in biventricular applications — both ventricles are catheterized, and performance is interrogated vsimultaneously.



## Your Trusted Partner in Research: Support & Education Resources

Successful research depends on reliable technology and trustworthy support, so Transonic delivers both. Pressure-Volume Loop data is vast and detailed, which can be both illuminating and challenging. We understand these challenges, so whether you are new to the approach, have years of experience, or simply have questions, we are here to help.

### On-Site and Off-Site Surgical Support

Proper surgical technique is a fundamental part of PV loop data collection. Our Team of Application Experts, each with a PhD and years of surgical experience, have designed a training program for your level of expertise. With both remote and personalized training available, we offer flexible, tailored support to meet your needs.

### Educational Library

Are you looking for application support, PV loop theory, or data collection tips? Our users have access to a wide range of support materials that have been created and curated by our Application Experts:

- PV loop Workbook: an invaluable resource for any PV loop user
- Surgical Videos
- Library of Recorded Webinars
- Research Blogs

### Ongoing Learning Opportunities

We believe in connecting and growing the PV loop community through education and support. Whether you have a new lab member, or want to enhance your own skill set, we offer a variety of ways to connect with peers and industry leaders:

- Multi-day Surgical PV Workshops: North America and Europe
- Client-lead Webinar Series
- Data Review and Protocol Design Guidance with our Application Experts

### Industry/Pharma

We also offer targeted services to Industry, including:

- Full-service data collection, including all hardware
- Data review and analysis packages

### LIMITED WARRANTY

Transonic® warrants for a period of two (2) years from date of shipment that ADV550 hardware, cables, power supply, and associated hardware accessories, purchased through Transonic® or its duly appointed distributor or licensed representative, are free from defects that result from faulty material or workmanship by Transonic®.

Transonic® warrants for a period of twelve (12) months from date of shipment that catheters less than two French (<2F) are free from defects that result from faulty material or workmanship by Transonic®. Transonic® warrants for a period of three (3) months from date of shipment that Catheters greater than two French (>2F) are free from defects that result from faulty material or workmanship by Transonic®. Warranty is only valid if Catheters are purchased through Transonic® or its duly appointed distributor or licensed representative.

The Transonic® warranty does not apply to: defects caused by abuse, neglect or misuse; damage due to accident or casualty; or unauthorized alterations by anyone other than Transonic® or an appointed repair center.

The Buyer pays shipping charges to the Transonic® plant or repair center; Transonic® will pay for return shipment charges.

If measurement accuracy is questioned during the two year warranty period, Transonic® shall inspect and recalibrate ADV550 hardware free of charge, provided that the Buyer pays for all shipping charges.



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