WE DESIGN AND DELIVER PREMIUM SENSING SOLUTIONS

setra

50th ANNIVERSARY

MADE IN THE USA

CRITICAL ENVIRONMENTS

WE DESIGN AND DELIVER
PREMIUM SENSING SOLUTIONS
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WHO IS SETRA?

Setra Systems, Inc. was founded in an age of transducer innovation. Our founders, Dr.Y.T. Li and Dr. S.Y. Lee were Professors of engineering at the Massachusetts Institute of Technology and co-developers of the Variable Capacitance Transduction Principle. Building on this heritage of innovation, Setra has designed and developed the most comprehensive product lines of pressure sensing transducers in the world. Setra has been innovating Test & Measurement sensor designs for over 50 years and has become a leader in the pressure transducer market.

- **Made in the USA**
- **Industry Leader for 50 years**
- **Innovator of the variable capacitance principle**
- **5-Sigma Quality**
- **95% On Time Delivery**
- **99.8% Quality Rating**
- **10+ Million Sensors Shipped**

Corporate Headquarters & Production Facility

Boxborough, Massachusetts, USA

WHEN PATIENT LIVES ARE AT RISK, TRUST SETRA TO ENSURE SAFETY

Not every room pressure monitor has the advanced capabilities of Setra's critical environment products. When it comes to ensuring your patient's safety, trust Setra's line of room pressure monitors to get the job done safely and reliably.

WHETHER YOU NEED:

- **High Accuracy at very low differential pressure**
- **Low Hysteresis, high repeatability, and superior linearity**
- **Extremely high signal-to-noise ratio**
- **Long term stability**
- **Shock, vibration, dust, humidity, and EMI protection**
- **Wide temperature compensation**
- **Advanced communication protocols**
- **Direct application engineering support**

SETRA HAS YOU COVERED

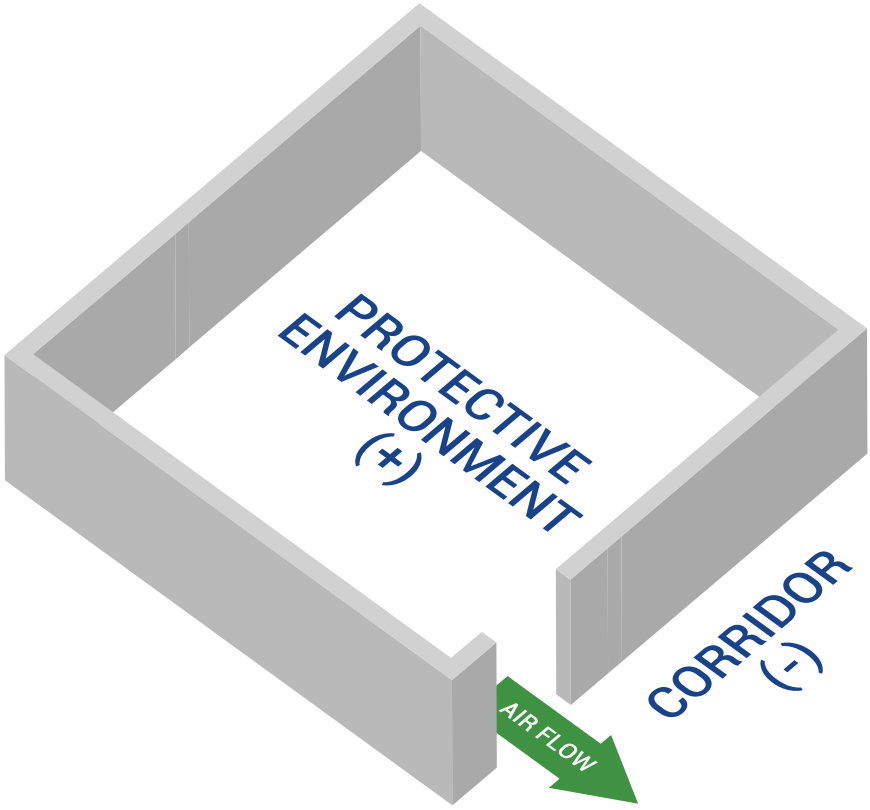
Contact us today

(800) 257-3872

www.setra.com

PROTECTIVE ENVIRONMENT

A **Protective Environment (PE)** is a specialized patient-care area, usually in a hospital, with a positive air flow relative to the corridor (i.e. air flows from the room to the outside adjacent space). The combination of HEPA filtration, high numbers of air changes per hour (>12ACH), and minimal leakage of air into the room creates an environment that can safely accommodate patients with threatening diseases that need to be contained.



ROOM PRESSURE MONITORS

Room pressure monitors (RPM) provide real-time monitoring to ensure that the protective environment is in a positive or negative pressure state and in compliance with safety regulations. These units guarantee that patients (or processes) within a protective environment are safe from potential contaminants existing in unfiltered air and ensure that hospital staff and other occupants are not at risk to what is contained within isolation.

POSITIVE PRESSURE

PATIENT ROOMS

OPERATING ROOMS

CSP PHARMACIES

THE JOINT COMMISSION

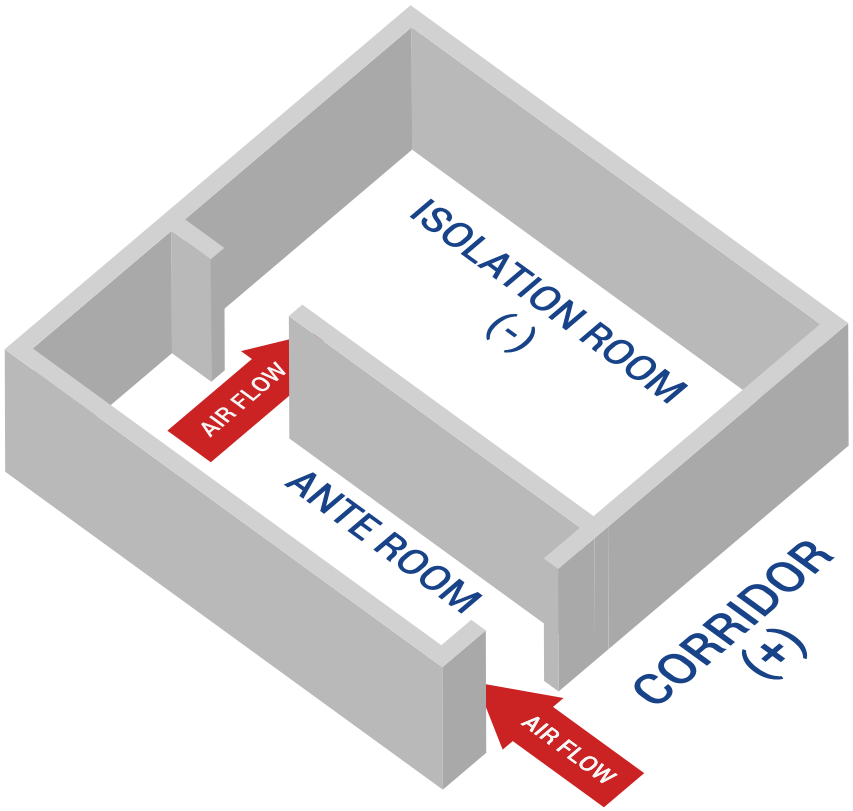
The Joint Commission's annual survey revealed that the Environmental of Care standard EC.02.06.01, which requires hospitals to adhere to the best practices for monitoring room differential pressure, was one of the top 10 most common violations.

ISOLATION ROOM

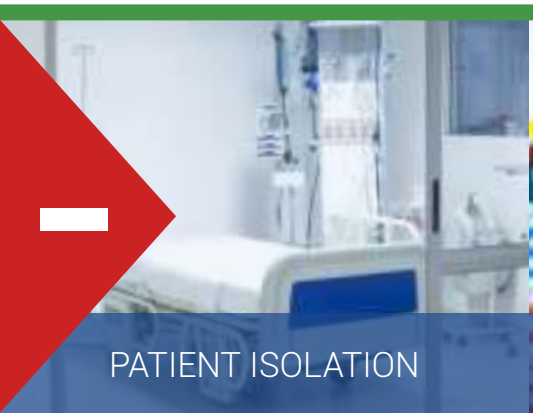
Airborne Infection Isolation (AII) refers to the isolation of patients infected with organisms spread via airborne droplet nuclei <5 µm in diameter. The isolation area requires air changes per hour (ACH) ranging from >12 ACH for new construction as of 2001 to >6 ACH for construction before 2001. Isolation rooms are negatively pressured, such that the direction of air flow moves from the outside adjacent space into the room. Air is then exhausted outside or recirculated through a high-efficiency air (HEPA) filters.

WHAT TO CONSIDER:

- Does the facility have a building automation system (BAS)
- What is the required communication protocol? (BACnet, analog, etc.)
- Does the job require audible/visual alarms? Local and/or remote?
- How many primary rooms need to be monitored? Do they need alarms?
- Is this a building upgrade or a new construction? Are there existing sensors in place?



NEGATIVE PRESSURE


PATIENT ISOLATION


BIO-SAFETY LABS


LABORATORY FUME HOODS

HOSPITAL LINENS

Of the environments within healthcare facilities that need to be pressurized, one of the most commonly overlooked spaces are linen closets. According to ASHRAE Standard 170, clean linens must be stored in a positively pressurized space and soiled linens must be stored and sorted in a negatively pressurized space with a minimum of 10 air changes per hour (ACH).

THE INSTALLED LEADER IN CRITICAL ENVIRONMENTS

With over 10 million installed worldwide, Setra's pressure transducers are the standard in the HVAC/R industry. Design engineers have made the Setra sensor the largest installed sensor base in the industry because of their superiority performance and reliability.

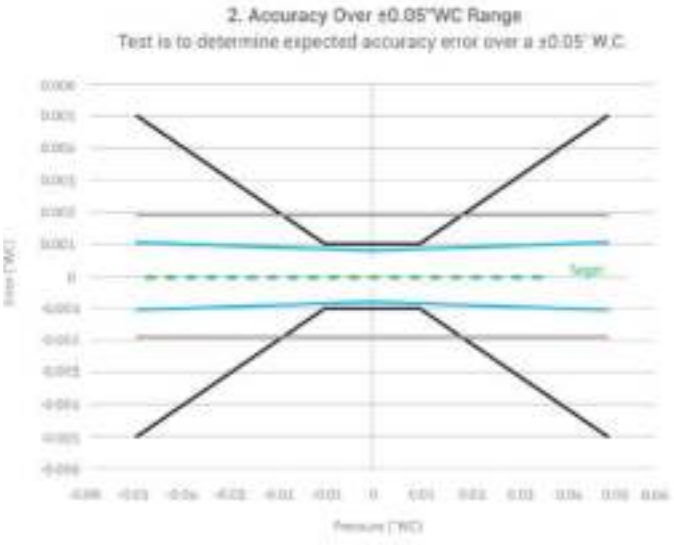
VARIABLE CAPACITANCE TECHNOLOGY

When used for room differential pressure, Setra FLEX has the option of either an on-board or external sensor, depending on the installer's preference. In either case, Setra's industry-best high-accuracy sensor is used. Our patented variable capacitance technology is based on an all stainless steel micro-TIG welded sensor. The radially tensioned stainless steel diaphragm and insulated stainless steel electrode, positioned close to the diaphragm, form a variable capacitor. This provides industry-best accuracy for very low pressures and unmatched long-term stability. Unlike competitors, who use a flow-through sensor that can become clogged or contaminated, Setra's dead-ended sensors ensure ultimate accuracy for patient safety.

SETRA VS. THE COMPETITION

At Setra, the performance of our product is second to none, which is why we have no reason to exaggerate our product capabilities. By reading through various competitors' technical specifications, it isn't always clear which product performs the best in specific applications. This is why we tested our product against two leading competitors.

Sensor A: 18.8% Rdg. Error; Sensor B: 10.0% Rdg. Error; Setra 5.7% Rdg. Error



Sensor A: 1.9% FS; Sensor B: 5.0% FS; Setra 1.0% FS

HIGH ACCURACY

Critical Environments are strictly regulated spaces requiring high accuracy in low pressure areas. The Center for Disease Control (CDC) recommends that a critical environment space maintain a minimum differential pressure of 0.01" W.C. Setra's pressure sensors are ideal to meet this recommendation because of their high accuracy capability at extremely low pressures.

Advantages:
- Ultra high accuracy: ±0.25% FS
- High Resolution - low as 0.0001" W.C.
- High signal/noise ratio

PREVENT CONTAMINATION

In critical environments, the greatest potential for sensor failure is due to contamination. Technologies such as thermo anemometry are inherently susceptible to failure due to their flow through design. Setra's dead ended design prevents particles from making contact with the sensor, eliminating the risk of failure.

Advantages:
- Long-term stability
- High resistance to harsh conditions
- Low contamination risk

RUGGED DESIGN

Setra's HVAC/R transducers are built using all stainless steel wetted materials for a rugged mechanical design. A measurable voltage change is produced by a very slight change in capacitor plate gap. The extremely small deflection of Setra sensor diaphragms helps to create a transducer that exhibits uniformly superior performance and reliability.

Advantages:
- High shock & vibration tolerance
- High repeatability
- Low hysteresis

ELECTRONICS

The electronics are responsible for fundamental features and important performance aspects of Setra's pressure transducer. Setra offers customized electronics achieve desired excitation inputs and signal-conditioned outputs for maximum performance.

Advantages:
- Electromagnetic interference (EMI) performance
- Improved thermal performance over specified temperature range

HIGH LEVEL OUTPUT

Most competitive sensors require >10x amplification of a signal output to achieve the low ranges which makes them more susceptible to poor long-term stability, thermal instability, high RFI susceptibility and humidity effects. Setra transducers are designed for low pressure applications therefore require no signal amplification.

Advantages:
- Long-term stability - 0.05% FS/year
- High signal/noise ratio

A SOLUTION FOR ALL APPLICATIONS

With Setra's wide variety of room pressure monitors, there is virtually no application we cannot accommodate. Whether you need a premium product that is BACnet capable or a less sophisticated but still effective analog product, we've got you covered. Setra's line of room pressure monitors not only measure and monitor the positive or negative room pressure, temperature, and humidity parameters but also report the condition of the rooms as occupied or unoccupied.

FLEX

ENVIRONMENTAL MONITOR & CONTROLLER

The Setra FLEX™ provides a flexible room environmental control and monitoring solution in a simple-to-use package. An attractive flush-mount faceplate is complemented by an intuitive graphical display to meet any architectural requirement. The unit supports 3 rooms, monitoring up to 6 parameters for each room. If additional I/O is required, an expansion I/O module enables the monitoring and control for more complicated applications. A differential pressure sensor can be either factory-installed in the unit or ordered separately and installed above the ceiling. Integration with building automation systems is made easy through either BACnet/IP or BACnet MS/TP network protocols.

SRCM

ROOM CONDITION MONITOR

The SRCM is the highest performance BACnet capable product for measuring low differential pressure in critical applications. Unlike the SRPM, the SRCM can monitor and alarm two rooms through one device, as well as display 3 additional parameters such as temperature, humidity, and CO2. The SCRM builds upon the SRPM's feature set by adding cloning functionality via a USB port, which ensures time and savings on installation in applications where multiple monitors are required.

SRPM

ROOM PRESSURE MONITOR

The SRPM is Setra's standard single room BACnet capable room pressure monitor for measuring low differential pressure in critical applications. The SRPM backlit touchscreen LCD provides an intuitive graphic user interface for ease of setup. The SRPM has a built-in calibration feature and only requires zeroing when installed, significantly reducing the cost of ownership. The SRPM monitors and alarms while providing a digital input for a door alarm. The SRPM is a simple, cost effective solution.

BACnet®

BACnet®, short for Building Automation Control Network, is a data communication protocol used for building automation and control networks. BACnet is both an international (ISO) and ANSI standard for interoperability between cooperating building automation devices.

ANALOG

Analog outputs are standard outputs (0-5 VDC, 0-10 VDC, or 4-20mA) for use as inputs into Building Automation Systems (BAS) or displaying parameters such as static pressure, differential pressure, temperature, humidity, or carbon dioxide.

MRMS

MULTI-ROOM MONITORING SYSTEM

The MRMS provides a central location to view critical room condition for up to 8 rooms with configurable audible/visible alarms. The MRMS' 4.3" color LCD touchscreen is easy to navigate and ideal for any healthcare facility that needs to monitor critical room status from a central nurses location. The MRMS significantly reduces installation and setup through its Auto-Discover feature, which automatically finds and connects to other Setra BACnet products and imports all MAC addresses, BACnet objects, and more.

SRIM

ROOM ISOLATION MONITOR

The SRIM is Setra's highest performance non-BACnet product measuring low differential pressure in critical applications. The SRIM is an ideal solution for anyone who requires cost-effective local monitoring and alarming of parameters, but does not require BACnet protocol. The SRIM has a 3-color backlit LCD display and visual/audible alarm setup for pressure, temperature and humidity. The SRIM has field selectable output as well as the ability to switch between pressure and velocity sensing modes.

HUMIDITY IN PHARMACIES

In pharmaceutical manufacturing, trace moisture can be absorbed on the surface of drugs, increasing the rate of decomposition and shortening shelf life. In addition, many pharmaceutical tablets are coated and then dried at a specific relative humidity. Manufacturing pharmaceutical products at extremely high humidity levels can negatively affect product quality, yield, and/or visual appearance.

A CASE STUDY

The advantage of Setra's variable capacitance technology is our high accuracy and long term stability in healthcare facilities. Technologies such as thermal anemometry are more inherently susceptible to contamination due to their flow-through design. One such example where a competitors flow-through sensors were replaced by Setra's was at a local Boston hospital.

At a local Boston hospital, nurses complained that it was difficult to open doors to exit operating rooms (OR). They found that the differential pressure sensors monitoring OR pressurization were contaminated by lint, which resulted in a compromised reading and over-pressurization of the space. As lint accumulates, they begin to under-report space differential pressure. Pressure is increased to the degree that it becomes difficult to push (or pull) open the doors to exit the ORs.

"The requirement for pressure is 0.01 inches water column. If the controls malfunction, and pressure is pumped up much higher, that is when one would begin to have difficulty with the door, feeling pressure against you as you try to push it open.," said Paul Lindberg, a Principal from Advantage Engineering, the HVAC engineering and design firm who found the cause of the over-pressurization issue. Along with doors being difficult to open, the sensor would be under-reporting the differential pressure therefore wasting significant amounts of energy. Frequent cleaning is not a viable option, so Lindberg contacted Boxborough, Massachusetts based Setra Systems, Inc.

"After contacting Setra, their factory representatives sent information on the SRPM for space differential and I was immediately interested in the fact that the sensor within the instrument are not exposed to the environmental air, so airborne lint can't disrupt them. The unit has definitely met my expectations and I will definitely recommend Setra Systems, Inc. for my next design job for OR suites or infectious isolation areas."

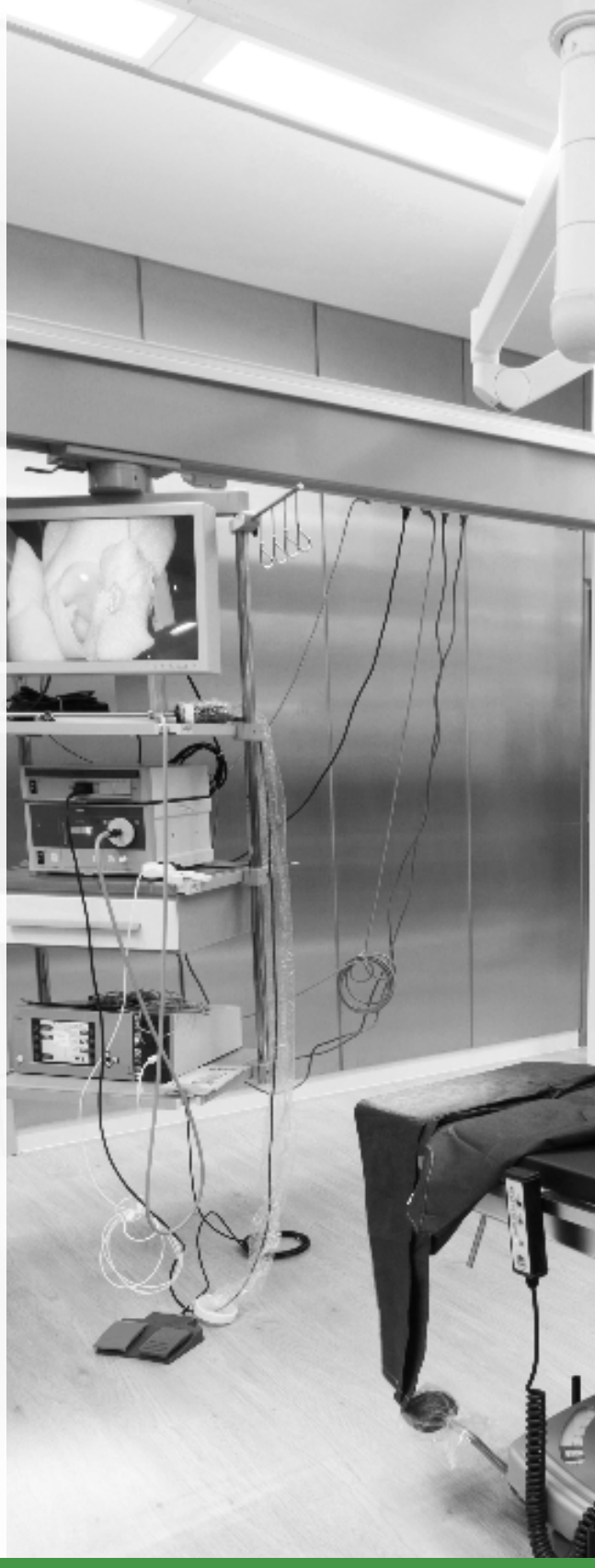
With Setra's products, there's a solution for every application




		FLEX	SRCM	SRPM	SRIM
PRESSURE SENSOR	On-board dead-ended stainless steel pressure transducer	✓	✓	✓	✓
	Full scale ranges as low as ±0.05" W.C.	✓	✓	✓	✓
	Accuracy as low as ±0.25%	✓	✓	✓	✓
MONITOR, ALARM, & CONTROL	Single room pressure parameter	✓	✓	✓	✓
	Two room pressure parameter	✓	✓		
	Three room pressure parameter & control	✓			
	Optional external pressure transducer	✓			
FEATURES	100% made in the USA	✓	✓	✓	✓
	User-defined room parameters	✓	✓	✓	✓
	Mounts in a standard electrical box	✓	✓	✓	✓
	Password protection	✓	✓	✓	✓
	Touch screen display	✓	✓	✓	
	Configurable over the network	✓	✓	✓	
	Positive, negative, neutral, and no isolation room modes	✓	✓	✓	
	Flush mount design	✓	✓		✓
	USB cloning feature	✓	✓		
	Integral full condition banner	✓	✓		
	User-defined room profiles	✓			
	Expandable I/O	✓			
	Parameters supported	18	4	1	3
INPUTS	Digital Inputs	11*	1	1	1
	Analog Inputs	12*	2		2
OUTPUTS	Field selectable analog output	✓	✓	✓	✓
	Relay Output	✓	✓	✓	✓
	BACnet IP	✓			
	BACnet MS/TP	✓	✓	✓	

*When used with Expansion I/O unit

CRITICAL ENVIRONMENTS



CELEBRATING 50 YEARS

Founded in 1967, Setra Systems, Inc. is a leading designer and manufacturer of pressure, acceleration, and weight sensing devices. Setra's founders, Dr. Y.T. Li and Dr. S.Y. Lee, were co–developers of the variable capacitance transduction principle, the innovative force sensing technology which is the heart of Setra's products.

MADE IN THE USA

Since our founding, we have been proudly producing all of our transducers for sale in the United States at our 100,000 sq. ft. Boxborough, MA facility. Setra is an ISO 9001-2008 certified manufacturer with robust and mature processes at work to continually optimize team performance.

DISCIPLINED BUSINESS MODEL

Setra is part of the Fortive group of companies, a diversified industrial growth organization based in Everett, Washington with 24,000 employees worldwide. The Fortive Business System (FBS) is the cornerstone of our culture and our ultimate competitive advantage. It drives every aspect of our work, our strategy and our performance. We use FBS to guide our decisions, measure how well we execute and develop innovative ways to do even better.

FORTIVE

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