ABB MEASUREMENT & ANALYTICS

EFFICIENT POSITIONERS AND I/P CONVERTERS

First class valve automation

ENGINEERED
TO OUTRUN

Measurement made easy

To operate any process efficiently, it is essential to measure, actuate, record and control. In selecting ABB you are choosing a partner who is offering the best measurement and analytical solution for your needs, enabling maximum return on your investment. When investing in ABB's measurement and analytical solutions you are receiving the best technology, reliability and service in the business.

Research and development is a vital source of ABB's technology leadership. ABB constantly builds on the foundation of existing technologies for new applications, and continues to develop the breakthrough technologies needed to meet the challenges of the future .

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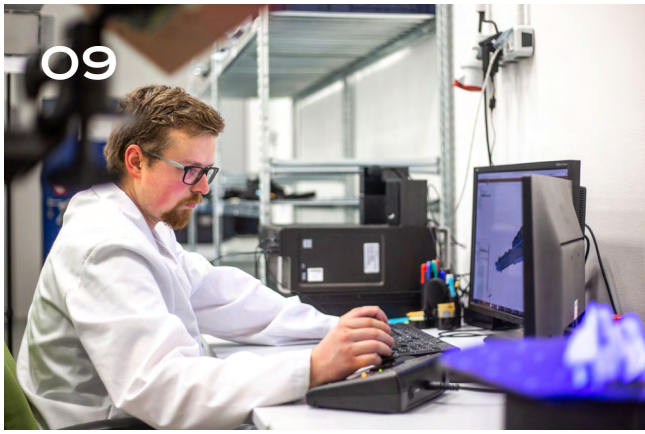


COMPREHENSIVE MEASUREMENT SOLUTIONS

Tailor-made for every industry

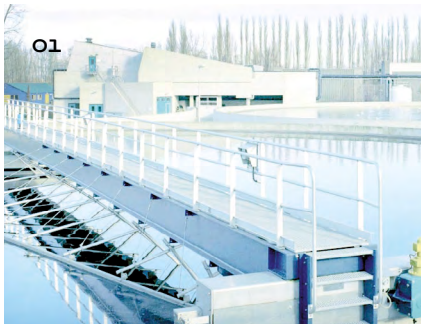
—
01 Water and waste water
—
02 Power and steam generation
—
03 Chemical and petrochemical
—
04 Oil and gas
—
05 Pulp and paper
—
06 Minerals
—
07 Metals
—
08 Food and beverages
—
09 Marine

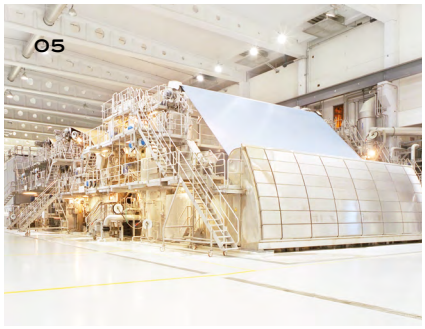
ABB‘s measurement and analytical products provide world-class measurement solutions for any industry, utility or municipality. Latest innovations deliver technological solutions to make it easier for you to run your plant. ABB’s measurement and analytics products are based on common technology, providing a common look and feel and method of operation. This results in products, that are easy to configure, easy to integrate, and easy to maintain.

For more information please visit:
abb.com/measurement

ABB’s measurement and analytics product portfolio:

- Analytical measurement
- Flow measurement
- Pressure measurement
- Temperature measurement
- Level measurement
- Actuators and positioners
- Recorders and controllers
- Device management, Fieldbus and Wireless
- Force measurement
- Service





DIGITAL POSITIONERS

Performance for harshest environments

The TZIDC and EDP300 series digital positioners provide flexible and cost-effective valve management and control. Their durability and unmatched shock and vibration immunity up to 10 g and 80 Hz means that they are suitable for use even under harsh conditions.

—
01 TZIDC digital positioner
—
02 TZIDC-200 digital positioner in explosion proof design
—
03 TZIDC in a gas distribution station
—
04 TZIDC in a hygienic application

The challenge – handling over 100,000 strokes a year
Most control valves in many processes will rarely have to move, commonly enabling operators to opt for positioners with lifetimes of less than 100,000 strokes. However, there are some applications where valves will need to handle frequent changes in process conditions. In such applications, where 100,000 strokes may occur in a single year alone, there is a need for a positioner that can handle these changes with minimal need for maintenance.

The solution – unrivalled performance performing 1,000,000 strokes
The answer is ABB's TZIDC positioner. In a four month trial, an ABB TZIDC positioner underwent a customer durability test which saw it perform 1,000,000 strokes without any deterioration in performance or fault or interruption.

Offering remote communication via 4 to 20 mA HART, PROFIBUS PA or Foundation Fieldbus, the TZIDC sets the standard for safe and economic control of industrial processes. Its built-in intelligence enables it to adapt itself to any control valve at the push of a button, while a host of service, diagnostic and safety functions, including fail-freeze and fail-safe action, help to provide a high level of operational performance.

The TZIDC and EDP300 is suitable for use with linear, part-turn, and single or double-acting actuators and is protected to IP65/NEMA 4X, making it ideal for harsh environments. You can rely on the TZIDC and EDP300 to provide the highest levels of availability, enabling you to maximize the profitability of your process through improved plant uptime.

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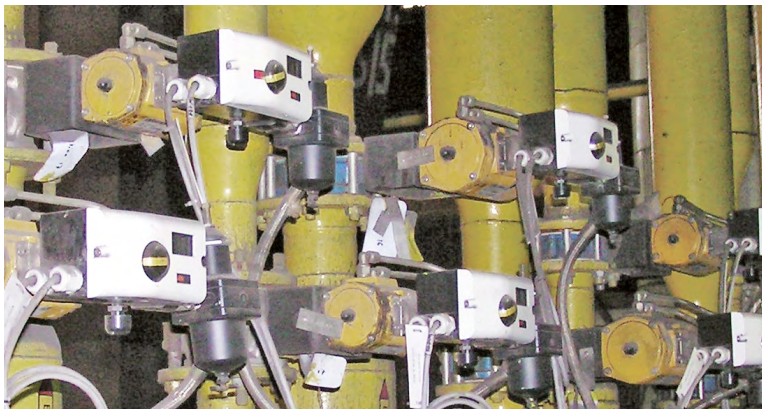

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The EDP300 digital positioner feature a high air capacity of 50 kg/h (23 scfm) at 10 bar (145 psi) and is equipped with advanced pressure-based diagnostic functions.

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01 EDP300 digital positioner
—
02 EDP300 digital positioner with stainless steel housing
—
03 The EDP300 on a linear actuator
—
04 The EDP300 in a remote sensor installation

Why are they used?
Compliance to environmental regulations
In any production process, it is critical to ensure stable and constant process conditions to achieve optimum product quality and process efficiency. Any control equipment must be capable of eliminating any variations in the process variables that could cause the process to consume both more energy and consumables than normal, pushing up production costs. The stability of the downstream control loop may also be affected, impacting on both product quantity and quality.

With the compressed air used by valve positioners being around ten times more expensive than electricity, accurate control is essential to minimizing plant overheads as well as eliminating potential problems in the downstream process.

The solution – accurate measurements for maximum energy efficiency
Thanks to an (innovative control algorithm taken from the field of robotics, the EDP300 positioner stands out thanks to its speed and accuracy. Overshooting and slow recovery times are both prevented, allowing the EDP300 to significantly optimize compressed air consumption, energy efficiency and the 'ecological footprint' of pneumatic control circuits.

Subsequently, the EDP300 is able to help reduce cost with its unique electro-pneumatic system, providing unsurpassed low air/gas consumption at steady state. The EDP300 can also be used in applications with natural gas as the supply energy, eliminating the need for compressed instrument air. ABB is the only supplier able to offer customers a premium positioner that features these pneumatic properties.

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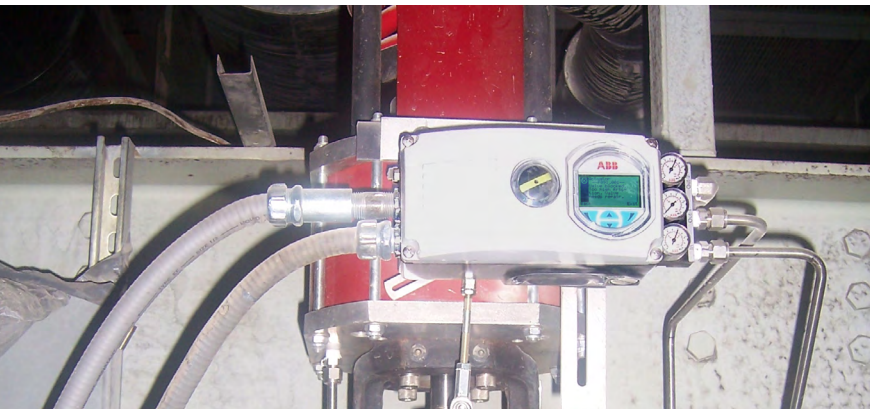

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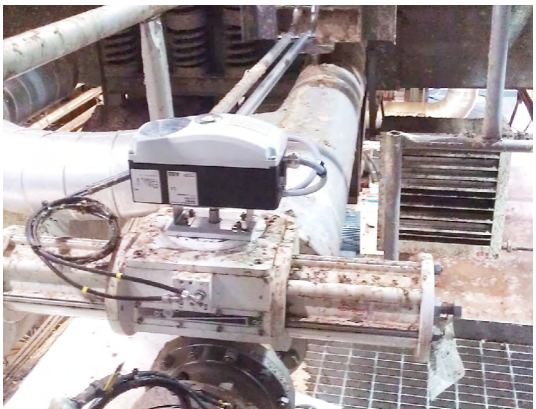

REMOTE SENSOR APPLICATION

Solutions for difficult applications

Remote sensor solutions is necessary for applications that are difficult to reach, or when the ambient temperature at the control actuator is high. In these cases the remote mount positioner solution provides safety and ease of use.

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01 EDP300 with remote sensor
—
02 EDP300 remote sensor unit on actuator
—
03 Remote EDP300 control unit mounted in cabinet with attached sensor cable

The challenge – applications where there is poor accessibility, increased vibrational loading or particularly harsh environmental conditions
These kinds of applications often involve higher costs due to gaining access especially during unexpected failures.

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The solution – using TZIDC or EDP300 positioners featuring a separate position sensor housing, which can be up to 10 m (32 ft) away from the device
Easier and safer access to the positioner in hard-to-reach valve installations.

Available as options:
- Enhanced vibration immunity up to 2 g at 300 Hz for higher frequency applications
- Advanced IP67 protection class for challenging applications
- Optional modules and mechanical feedback for the valve position
- Stainless steel housing for offshore use
- Increased temperature resistance of up to 100 °C (212 °F)

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DIGITAL POSITIONERS
Features

	TZIDC	TZIDC-200	EDP300
Input / Communication			
4 to 20 mA LCI	TZIDC	TZIDC-200	
4 to 20 mA HART	TZIDC	TZIDC-200	EDP300
PROFIBUS PA	TZIDC-110	TZIDC-210	
FOUNDATION Fieldbus	TZIDC-120	TZIDC-220	
Explosion protection			
Without	•		•
Intrinsically Safe	•		•
Flameproof / Explosion-proof		•	
Pneumatic output			
Single acting	•	•	•
Double acting	•	•	•
Safe position			
Fail-safe	•	•	•
Fail-freeze	•	•	•
Emergency Shutdown			
ESD			•
Diagnostics			
Basic diagnostics	•	•	•
Advanced diagnostics			•
Valve signature			•
Partial stroke			•
Housing			
Aluminum	•	•	•
Stainless steel			•
Supply pressure			
Up to 6 bar (90 psi)	•	•	•
Up to 10 bar (145 psi)			•
Air capacity			
Up to 10 Nm^3/h (6 scfm)	•	•	•
Up to 40 Nm^3/h (23 scfm)			•
Position sensor			
Potentiometer (Standard)	•	•	•
Contactless sensor (Optional)	•	•	•
Remote version			
With HART communication	•		•

I/P CONVERTER
Improved process control

—
01 I/P converter with field housing
—
02 I/P converter for rail mounting
—
03 Robust field mount I/P converters for valve position control
—
04 Compact panel mount I/P converters

The challenge – dealing with particles blocking a valve
Certain types of enzyme production processes have traditionally posed a problem for accurate valve control where particles of a certain size can cause valves to become blocked, resulting in unplanned downtime to trace and rectify the problem. In the enzyme production processes, problems can arise from the presence of larger cellulose particles in the process fluids. Planned downtime can arise as a result of troubleshooting and correcting the faults.

The solution – using I/P signal converters for valve position control
The solution to this problem is to use an I/P signal converter as part of an open loop control system. The converter regulates the position of a small diaphragm valve with a 15 mm (0.59 in) stroke. The valve controls the flow over a range of 50 to 2,000 l/h (13.20 to 528.34 gph), with an accuracy of ±3 to 5 l/h (±0.79 to 1.32 gph).

By responding less quickly to changes on the process side of the valve, the signal converter introduces a delay in the valve response so that it effectively ignores any short term deviations caused by cellulose particles passing the valve.

This helps to prevent the valve from becoming blocked, even when it is only slightly open. The consequent reduction in unplanned plant downtime and associated production disruption help boost profitability and increase plant availability.

Key features & benefits
- Compact design and variable mounting positions for maximum installation flexibility
- Output signal from 0.2 to 1 bar (3 to 15 psi)
- Robust design with IP65 field housing enables use in arduous and hostile environments
- High functional stability helps maximize control accuracy
- Vibration immunity up to 10g / 80Hz provides unsurpassed performance

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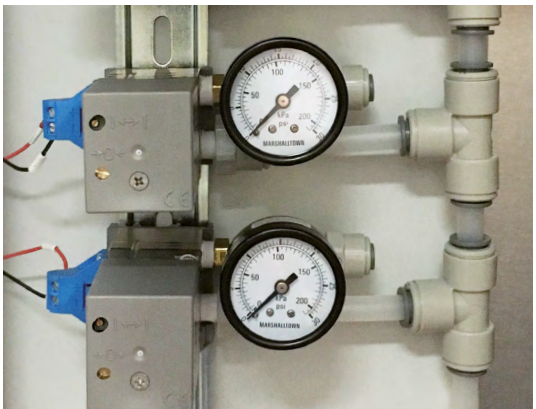
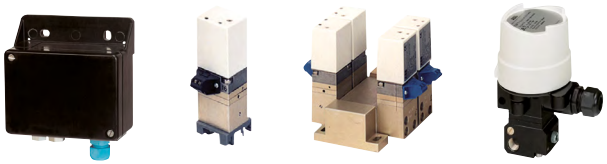


I/P CONVERTERS
Features



	TEIP 11	TEIP 11-PS
Input (additional ranges available upon request)		
0 to 20 mA	•	•
4 to 20 mA	•	•
Output (additional ranges available upon request)		
0.2 to 1 bar (3 to 15 psi)	•	•
Housing		
Control room housing – DIN rail mounting – IP 20	•	•
Control room housing – manifold mounting – IP 20		•
Plastic – IP 54		•
Aluminum – IP 65	•	•
Stainless steel – IP 65	•	•
Explosion protection		
Without	•	•
Intrinsic safe	•	•
Explosion proof	•	•
Influence of vibration	< 1 % up to 10 g and 80 Hz	
Ambient temperature range	–40 to 85 °C (–40 to 185 °F) Optional –55 to 85°C (–67 to 185°F)	
Supply pressure	1.4 to 10 bar (20 to 145 psi)	1.4 bar (20 psi) Optional: 2.5 bar (36 psi)
Air capacity at 6 bar (90psi)	0.16 kg/h = 0.3 Nm^3/h = 0.12 scfm @ 6 bar (90 psi)	≥kg/h = 4.1 Nm^3/h = 2.4 scfm
Air consumption – Maximum	0.16 kg/h = 0.3 Nm^3/h = 0.12 scfm @ 6 bar (90 psi)	≤0.2 kg/h = 0.16 Nm^3/h = 0.1 scfm

ANALOG POSITIONERS
Reliable solution for basic applications

—
01 AV1 pneumatic positioner
—
02 AV27 electro-pneumatic positioner
—
03 AV1 on Control valve application
—
04 AV2 on Control valve application

Why are they used?
The AV series provides the highest throughput air capacity in the industry without changing the spool valve. With its rugged design, these positioners have built a widespread reputation for providing long-life service. The AV is standard for either single or double acting fail safe applications suitable for linear or rotary type actuators. An optional position feedback transmitter is available for further flexibility.

AV1 pneumatic positioner
Accepts a pneumatic input signal 0.2 to 1 bar (3 to 15 psi) to provide sensitive and accurate positioning of a pneumatic final control element via its integral spool valve. A high temperature option is available for applications up to 121 °C (250 °F).

AV2 and AV27 electro-pneumatic positioner
Accepts a 4 to 20 mA input from a controller and converts the signal to an pneumatic output via its integral I/P and spool valve to provide sensitive and accurate positioning of a pneumatic final control element. The model AV27 is an explosion proof solution with press-fit I/P mounted to the outside of the positioner housing. The result: a complete integrated explosion proof positioner.

Key features & benefits
- High supply pressure applicability – up to 10 bar (145psi)
- High throughput capacity – up to 49 Nm^3h (29 scfm) at 6 bar (90 psi) air supply pressure
- Characterizable output – large positioning cam contains linear, square and square root relationships
- Accurate calibration – independent zero and span adjustments eliminate interaction and provide fast, accurate calibration
- Split range service – split range capability allows sequencing of multiple actuators using a single control signal

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ANALOG POSITIONERS
Features

	AV1	AV2	AV27
Explosion protection			
Without	•	•	
Intrinsically Safe (FM/CSA)	•	•	
Flameproof / Explosion proof			•
Compliance			
CE	•	•	•
Input signal			
0.2 to 1 bar / 3 to 15 psi	•		
4 to 20 mA		•	•
Position feedback			
4 to 20 mA	•	•	
Housing			
Aluminum	•	•	•
Supply pressure			
Up to 10 bar (145 psi)	•	•	•
Air capacity @ 6 bar (90 psi)			
Up to 49 Nm^3/h (29 scfm)	•	•	•
Ambient temperature			
–40 to 82 °C (–40 to 180 °F)	•	•	•
–20 to 121 °C (–4 to 250 °F)	•		

Trademarks
HART is a registered trademark of HART Communication Foundation
PROFIBUS and PROFIBUS PA are registered trademarks of PROFIBUS & PROFINET International (PI)
FOUNDATION Fieldbus is a registered trademark of FieldComm Group, Austin, Texas, USA

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www.abb.com/contacts

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www.solutions.abb/instrumentation

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