

ABB MEASUREMENT & ANALYTICS | DATA SHEET

TZIDC

Digital positioner



Brief description

The TZIDC is an electronically configurable positioner with communication capabilities designed for mounting on pneumatic linear or rotary actuators. It features a small and compact design, a modular construction, and an excellent cost-performance ratio.

Fully automatic determination of the control parameters and adaptation to the positioner allow for considerable time savings as well as optimum control behavior.

Pneumatics

An I/P module with subsequent pneumatic amplifier is used to control the pneumatic actuator. The well-proven I/P module proportionally converts the permanent electrical setpoint signal from the CPU into a pneumatic signal used to adjust a 3/3-way valve.

Dosing of the air flow for pressurizing or depressurizing the actuator is continuously adjusted. As a result, excellent control results are achieved. When reaching the setpoint, the 3/3-way valve is closed in center position to minimize the air consumption.

The pneumatic system can be supplied in four versions: for single acting and double acting actuators and each with the 'fail-safe' / 'fail-freeze' safety function.

'Fail-safe' safety function

If the electric power supply fails, the positioner output 1 is depressurized and the return spring in the pneumatic actuator moves the valve to the safe position. In case of a 'double-acting' version, output 2 is additionally pressurized.

'Fail-freeze' function

If the electric power supply fails, the positioner Output 1 (and Output 2 if applicable) is closed and the pneumatic actuator blocks the valve in the current position. If the compressed air supply power fails, the positioner depressurizes the actuator.

Use

The positioner has a built-in operating panel providing a 2-line LCD indicator and 4 operating buttons for commissioning, configuration and monitoring during live operation.

Alternatively, the appropriate configuration program can be used via the available communication interface.

Communication

The positioner has a local communication interface (LCI) as standard. Additionally, a 'HART® communication' option for communication via the 20 mA signal is available. Both communications are based on the HART® Protocol. Alternatively, HART®5 or HART®7 are available.

Inputs / Outputs

In addition to its input for the analog position setpoint, the positioner is equipped with a digital input which can be used to activate control system functions in the device. A digital output allows you to output collective messages (alarms / faults).

Modular design

The basic model can be enhanced at any time by retrofitting optional equipment.

Option modules can be installed for analog and digital position feedback.

Additionally, a mechanical position indicator, proximity switches or 24 V microswitches are available for indicating the position independently of the mother board function.

... Brief description

Schematic diagram

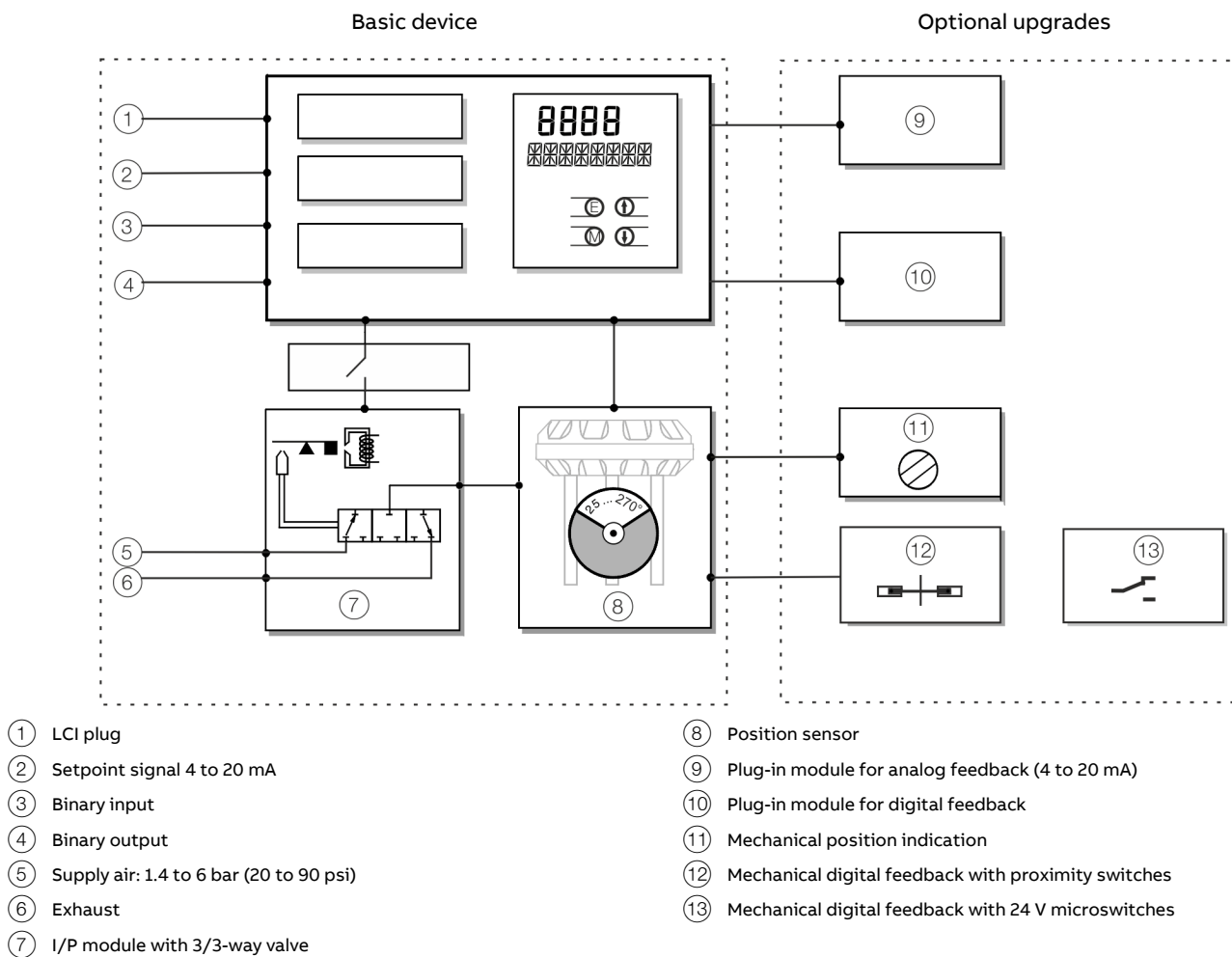


Figure 1: Schematic diagram of the positioner

Note

With optional upgrades, either the 'Mechanical digital feedback with proximity switches' ⑫ or 'Mechanical digital feedback with 24 V microswitches' ⑬ can be used. The mechanical position indication ⑪ must be installed in both cases.

Specification

Actuator travel

Rotation angle	
Measuring range	270°
Working range	Linear actuators min. 25°, max. 45° Rotary actuators min. 25°, max. <270° (cf. Figure 11)
Actuator travel limit	Min. and max. limits, freely configurable in range of 0 to 100 % of total travel (min. range > 20 %)
Actuator travel time prolongation	Setting range of 0 to 200 seconds, separately for each direction
Dead band time limit	Setting range 0 to 200 seconds (monitoring parameter for the control deviation until the dead band is reached)

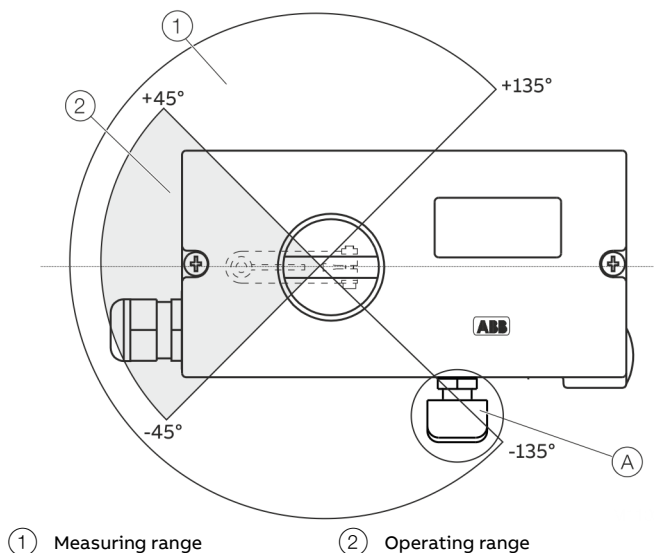


Figure 11: Measuring and operating ranges of the positioner

Pneumatic connections

Cable	Air Pipe
Thread ½-14 NPT	Thread ¼-18 NPT
Thread M20 × 1.5	Thread ¼-18 NPT
Thread M20 × 1.5	Thread G ¼
Thread G ½	Thread Rc ¼
(Optional: with cable gland(s) and blind plugs as necessary)	

Compressed air output

Range	Standard design: 0 to 6 bar (0 to 90 psi) Marine version: 0 to 5.5 bar (0 to 80 psi)
Air capacity	> 5 kg/h = 3.9 Nm³/h = 2.3 scfm at 1.4 bar (20 psi) supply air pressure > 13 kg/h = 10 Nm³/h = 6 scfm at 6 bar (90 psi) supply air pressure
Output function	For single acting or double acting actuators Air is vented from actuator / actuator is blocked in case of (electric) power failure
Shut-off values	End position 0 % = 0 to 45 % End position 100 % = 55 to 100 %

Instrument air*

Purity	Maximum particle size: 5 µm Maximum particle density: 5 mg/m³
Oil content	Maximum concentration 1 mg/m³
Pressure dew point	10 K below operating temperature
Supply pressure**	Standard design: 1.4 to 6 bar (20 to 90 psi) Marine version: 1.6 to 5.5 bar (23 to 80 psi)
Air consumption***	< 0.03 kg/h / 0.015 scfm

* Free of oil, water and dust in accordance with DIN / ISO 8573-1, pollution and oil content according to Class 3 (except for natural gas variant)

** Do not exceed the maximum output pressure of the actuator

*** Independent of supply pressure

Ordering Information

Main ordering information TZIDC

Base model	V18345	XX	X	X	X	X	X	XX	X
TZIDC digital positioner, intelligent, configurable, with indicator and operator panel									
Case / Mounting									
Case made of aluminium, varnished, for mounting to linear actuators acc. DIN / IEC 534 / NAMUR or to rotary actuators acc. VDI / VDE 3845		10							
Case made of aluminium, varnished, with mechanical position indicator, for mounting to linear actuators acc. DIN / IEC 534 / NAMUR or to rotary actuators acc. VDI / VDE 3845		20							
Case made of aluminium, varnished, for integral mounting to control valves (see dimensional drawing)		30							
Case made of aluminium, varnished, with mechanical position indicator, for integral mounting to control valves (see dimensional drawing)		40							
Remote sensor control unit		70*							
Input / Communication Port									
Input 4 to 20 mA, two-wire, with connector plug for LCI adapter		1							
Input 4 to 20 mA, two-wire, with connector plug for LCI adapter and FSK module for HART communication		2							
Explosion Protection									
Without				0					
ATEX II 2 G Ex ib IIC T6 resp. T4 Gb				1					
cFMus				2					
IECEX Ex ib IIC T6 resp. T4 Gb				5					
ATEX II 2 G Ex ia IIC T6 resp. T4 Gb				7					
EAC TR-CU-012 Ex ia IIC T6/T4 Gb				H**					
EAC TR-CU-012 Ex ib IIC T6/T4 Gb				J**					
IECEX ia IIC T6 resp. T4 Gb				K					
NEPSI Ex ia II CT4/T5/T6 Gb				U					
NEPSI Ex ib II CT4/T5/T6 Gb				V					
INMETRO Ex ia IIC Gb / Ex ib IIC Gb				P					
Output / Safe Position (in case of an electrical power failure)									
Single acting, fail safe					1				
Single acting, fail freeze					2				
Double acting, fail safe					4***				
Double acting, fail freeze					5***				

* With standard characteristic curve, if delivered without remote sensor

** Reduced Functionality

*** Not for for integral mounting

Continued see next page

TZIDC digital positioner, intelligent, configurable, with indicator and operator panel	X	X	XX	X
Connections				
Cable: Thread ½-14 NPT, air pipe: Thread ¼-18 NPT	2			
Cable: Thread M20 × 1.5, air pipe: Thread ¼-18 NPT	5			
Cable: Thread M20 × 1.5, air pipe: Thread G ¼	6			
Cable: Thread G ½, air pipe: Thread Rc ¼	7			
Option Modules for Analog or Digital Position Feedback				
Without		0		
Plug-in module for analog position feedback, signal range 4 bis 20 mA, two-wire		1		
Plug-in module for digital position feedback		3		
Plug-in module for analog position feedback, signal range 4 bis 20 mA, two-wire, and digital position feedback		5		
Optional mechanical digital Feedback				
Without			00	
Mechanical kit for digital position feedback with proximity switches S32-SN (NC or logical 1)			10*	
Mechanical kit for digital position feedback with 24 V AC / DC microswitches (change-over contacts)			50**	
Design (Varnish / Coding)				
Standard				1
Higher Stiffness + Lower Air Capacity				H***
Protection Class IP 66 / NEMA 4X				P
Increased Corrosion Protection				S

* Only for model with mechanical position indicator, no IECEx

** Not for explosion protected version and only for model with mechanical position indicator

*** Only with Type Double Acting

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