ELECTRO-PNEUMATIC POSITIONERS
PE986

DESCRIPTION

The ADCATrol PE986 is an electro-pneumatic positioner used for direct operation of pneumatic linear or rotary actuators by means of electrical controllers or control systems with a 4 to 20 mA, 2 to 10 V or split ranges output.
The positioner features a compact design and a modular construction which allows easy attachment of options such as limit switches, analog feedback modules, manifolds, volume boosters, amongst others.

MAIN FEATURES

Compact and flexible design.
Mounting onto any linear or rotary actuator.
Single or double acting.
Supply pressure up to 6 bar.
Adjustable amplification and damping.
Independent adjustment of stroke range and zero position.
Resistant to vibration effect in all directions.
ATEX approval (Ex ia).

OPTIONS AND ACCESSORIES

Module for analog position feedback.
Digital position feedback with inductive switches (two or three-wire system).
Digital position feedback with microswitches.
Attachment kit for linear actuators acc. to IEC 534/NAMUR.
Attachment kit with rotary adaptor for rotary actuators acc. to VID/VDE 3845.
Connection manifold with gauges.
ATEX approval (Ex d): Version PE983.
Volume boosters.

TECHNICAL DATA

GENERAL	
Material	Housing: Alluminium finished with DD-varnish black Mounting bracket: Alluminium Moving parts of feedback system: AISI 303 /1.4305 or AISI 316Ti / 1.4571
IP rating	Protection class IP 54 (IP 65 on request)
Pneumatic connections	Female threaded ISO 228 G 1/8”
Electrical connections	M20 x 1,5 Cable glands Screw terminals: max. 2.5 mm²
Weight	Single acting: approx. 1,5 kg Double acting: approx. 1,8 kg Attachment kit: For diaphragm actuators: approx. 0,3 kg For rotary actuators: approx. 0,5 kg

AMBIENT CONDITIONS	
Ambient temperature	-40 ºC to 80 ºC
Relative humidity	Up to 100%
Operating conditions	According to IEC 654-1; The device can be operated at a class D2 location
Transport and storage temperature	-50 ºC to 80 ºC
Storage conditions	According to IEC 60 721-3-1: 1K5, 1B1, 1C2, 1S3, 1M2

ELECTROMAGNETIC COMPATIBILITY (EMC)	
Operating conditions	Industrial environment
Immunity	According to EN 61326 and EN 61000-6-2
Emission	According to EN 61326, Class A and EN 61000-6-3

Remark: NAMUR recommendation fulfilled

CE MARKING	
Electromagnetic compatibility	89/336/EWG
Low-voltage regulation	73/23/EWG not applicable

CAPACITY AT MAXIMUM DEVIATION (Nl/h)				
AIR PRESSURE SUPPLY	**1,4 bar**	**2 bar**	**4 bar**	**6 bar**
Without booster	2700	3500	5500	7500
With booster LEXG-FN/GN	18000	24000	40000	55000
With booster LEXG-HN	38000	48000	80000	110000

INPUT SIGNAL	
Signal range	4 to 20 mA or 2 to 10 V
Input resistance	< 200 Ω at 20 ºC
Stroke range	20 to 100% of the nominal operating range
Angular range	Linear: 30 º to 120 º Equal percentage: 90 º; from 70 º linear

OUTPUT SIGNAL	
Output to actuator	0 to 100 % supply air pressure

AIR SUPPLY *	
Air supply pressure	1,4 to 6 bar (20 to 90 psig)
Solid particle size and density	Class 2
Oil rate	Class 3
Pressure dew point	10K below ambient temperature

* According to ISO 8573-1.
Remark: For air supply, we recommend the ADCA P10 filter regulator.

AIR CONSUMPTION	
Single acting	Air supply 1.4 bar (20 psig) 200 Nl/h (7,1 scfh)
	Air supply 3.0 bar (45 psig) 400 Nl/h (12,4 scfh)
	Air supply 6.0 bar (90 psig) 600 Nl/h (21,2 scfh)
Double acting	Air supply 1.4 bar (20 psig) 350 Nl/h (10,6 scfh)
	Air supply 3.0 bar (45 psig) 550 Nl/h (17,7 scfh)
	Air supply 6.0 bar (90 psig) 750 Nl/h (33,5 scfh)

AIR OUTPUT
Load effect *
-3 % for delivery flow 2350 Nl/h (83 scfh)
+3 % for exhausted flow 1900 Nl/h (67 scfh)

* Measured with air supply 1,4 bar and 50% of the signal range.

RESPONSE CHARACTERISTIC *	
Amplification	Adjustable
Sensitivity	< 0,1% F.S.
Non-linearity (terminal based adjustment)	< 1,0 % F.S.
Hysteresis	< 0,3 % F.S.
Supply air dependency	< 0,3 % / 0,1 bar
Temperature effect	< 0,5 % / 10 K

* Data based on the following parameters: stroke 30 mm, feedback lever 117,5 mm, max. amplification, air supply pressure 3 bar.

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IS PE986.10 E 00.20

OPTIONS AND ACCESSORIES

INDUCTIVE LIMIT SWITCH (TWO-WIRE SYSTEM)	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 inductive proximity sensors acc. to DIN 19 234 resp. NAMUR for connection to a switching amplifier with an intrinsically safe control circuit **a)**
Current consumption	Vane clear: > 3 mA Vane interposed: < 1 mA
Supply voltage	DC 8 V, Ri approx. 1 kΩ
Residual ripple	< 5 %
Permissible line resistance	< 100 Ω
Response characteristic b)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 1 % Switching point repeatability: < 0,2 % EMC: according to EN 60 947-5-2

a) For the standard version one switching amplifier is required. For the security version fail-safe amplifier for each inductive proximity sensor is required; Operating mode minimum (= low) / maximum (= high) selectable by adjustment of switch vanes; Operating mode normally closed circuit / normally open circuit selectable at switch amplifier output.
b) For feedback lever effective length 117,5 mm (4,63 in), stroke 30 mm (1,28 in) and maximum gain.

LIMIT SWITCH ASSEMBLY WITH MICROSWITCHES	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 micro switches **d)**
Connected load, alternating current	Switching capacity: max. 250 VA Switching voltage: max. 250 V Switching current with ohmic resistance: max. 5 A Inductive resistance: max. 2 A Bulb, metal filament: max. 0,5 A
Connected load, direct current (refer to the following table)	

Switching voltage, max. (V)	Ohmic load (A)	Inductive load (A)
30	5	3
50	1	1
75	0,75	0,75
125	0,5	0,03
250	0,25	0,03

Response characteristic d)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 2,5 % Switching point repeatability: < 0,2 %

d) For feedback lever effective length 117,5 mm (4,63 in), stroke 30 mm (1,28 in) and maximum gain.

INDUCTIVE LIMIT SWITCH (THREE-WIRE SYSTEM)	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 inductive proximity sensors, three-wire system, LED indication, contact, pnp **b)**
Supply voltage U_S	DC 10 to 30 V
Residual ripple	± 10 %, U_S = 30 V
Switching frequency	2 kHz
Constant current	100 mA
Response characteristic c)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 1 % Switching point repeatability: < 0.2 %

b) Operating mode minimum (= low) / maximum (= high) selectable by adjustment of switch vanes; Contact closed within the positive range.
c) For feedback lever effective length 117,5 mm (4,63 in), stroke 30 mm (1,28 in) and maximum gain.

CONNECTION MANIFOLD WITH GAUGES	
Indicating range	Stroke / angle from actuator via positioner feedback lever
Error limit	class 1.6
Pneumatic connections	Female threads Q1/4-18 NPT according to DIN 45 141

ANALOG POSITION FEEDBACK	
Sensor	Resistive precision conductive plastic element
Input	Stroke/angle from actuator via position feedback lever; Stroke range: 8 to 100 mm (0,3 to 4 in) Angular range: 60 ° to 120 °
Output	Two-wire system Signal range: 4 to 20 mA
Permitted load	R_{Bmax} = (U_S - 12 V) / 0,02A (U_S = Supply voltage)
Power supply	Supply voltage: DC 12 to 36 V Permitted ripple: < 10 % p.p. Supply voltage dependency: < 0,2 %
Response characteristic e)	Non-linearity with terminal based setting: < 1,0 % F.S Hysterisis: < 0,5 % F.S. External resistance dependency: < 0,2 % / $R_{B\,max}$ Temperature effect: < 0,3 % / 10 K

e) For feedback lever effective length 117,5 mm (4,63 in), stroke 30 mm (1,28 in) and maximum gain.

COMMON DATA FOR OPTIONS AND ACCESSORIES	
GENERAL	
IP rating	Protection class IP 54; IP 65 on request
Mounting	Attachment to positioner
Electrical connections	Line entry: 1 or 2 cable glands M20 x 1,5 or 1/2"-14 NPT (others with Adapter AD-...) Cable diameter: 6 to 12 mm (0,24 to 0,47 in) Screw terminals: max. 2.5 mm² (AWG14) Optionally: Threaded gland made of AISI 303 (1.4305)
Materials	Base plate: galvanized steel Control vane: alluminium Setting mechanism: fibre glass-reinforced polyamide

AMBIENT CONDITIONS	
Ambient temperature f)	-25 to 80 ºC
Relative humidity	Up to 100%
Operating conditions	According to IEC 654-1; The device can be operated at a class D2 location
Transport and storage temperature	-40 ºC to 80 ºC

f) Refer to the section "Explosion protection", in page 5, with respect to explosion-protected equipment; -40 ºC to 80 ºC for the fail-safe version of inductive limit switch.

SAFETY REQUIREMENTS

SAFETY	
Acc. to EN 61 010-1 (resp. IEC 1010-1)	safety class III, pollution degree 2, overvoltage category I
Limit Switch (accessory equipment)	safety class II, pollution degree 2, overvoltage category II

EXPLOSION PROTECTION TYPE Ex ia/ib	
Basic device type	AI 633
Type of protection	II 2 G Ex ib/ia IIB/IIC T4/T6
Certificate of conformity	PTB 02 ATEX 2153
For operation in certified intrinsically safe circuits with the following maximum values of input circuit: U_i: 30 V I_i: 150 mA P_i: refer to the following table:	

P_i (W)	T6 (ºC)	T4 (ºC)
2	40	90
1,5	50	90
1	57,5	90

Internal inductance	Negligible
Internal capacitance	Negligible

The control circuit is galvanically separate from earth and all other electric circuits.

EXPLOSION PROTECTION ZONE 2 *
It is recommended that the instrument version for protection type Ex ia is used. In the Federal Republic of Germany, these instruments may be operated in Zone 2 with non-intrinsically safe circuits if the operating values do not exceed the maximum reference values.

EXPLOSION PROTECTION ACCORDING TO FM AND CSA *
Electro-pneumatic positioner type BIM 633 Intrinsically safe, Class I, Division 1, Groups A, B, C, D, hazardous locations.

* National installation regulations must be observed.

LIMIT SWITCH
Type of protection intrinsic safety Ex ib/ia IIB/IIC with the following maximum values: U_i: 16 V I_i: 25 mA P_i: 64 mW Internal inductance: 100 µH Internal capacitance: 30 nF The signal circuits are galvanically separate from earth, from each other and from all other electric circuits.

POSITION TRANSMITTER
Type of protection intrinsic safety Ex ib/ia IIB/IIC with the following maximum values: For temperature class T4 and a maximally permissible outside ambient temperature of 80 °C: U_i: 30 V I_i: 130 mA P_i: 0,9 W For temperature class T4 and a maximally permissible outside ambient temperature of 60 °C: U_i: 22 V I_i: 66 mA P_i: 0,5 W The effective internal inductance Li left amounts to 9 µH, the effective capacity Ci against earth amounts to 10 nF and/or differential 6 nF. The supply and signal circuits are galvanically separate from earth and from all other electric circuits.

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IS PE986.10 E 00.20

ELECTRO-PNEUMATIC POSITIONERS
PI991

DESCRIPTION

The ADCATrol PI991 is a digital intelligent electronically configurable positioner with communication capabilities, designed for mounting to pneumatic linear or rotary actuators. Communication protocols include analog (4 to 20 mA) with or without superimposed HART communication, PROFIBUS PA and FOUNDATION Fieldbus-H1.
The advanced diagnostic can be partially shown on the local LCD of the positioner or fully on a PC or a DCS workstation with a DTM based software (VALcare or Valve Monitor).
The PI991 also has the capability to control a Partial Stroke Test (PST) that offers to operators a tool to identify the trouble-proof function of ESD (Emergency Shut Down) valves.

MAIN FEATURES

Low operating cost.
Compact and flexible design.
Easy to comission with user-friendly interface.
Status and diagnostic messages displayed on LCD.
Integrated mechanical position indicator.
Mounting onto any linear or rotary actuator.
Single or double acting.

OPTIONS AND ACCESSORIES

HART, Profibus PA or FOUNDATION Fieldbus-H1 communication.
SIL3 certification.
ATEX, FM, CSA and IECEx approvals.
Stainless Steel housing for Offshore or Food and Beverage applications.
Module for analog position feedback.
Binary inputs and outputs.
Digital position feedback with inductive switches (two or three-wire system).
Digital position feedback with microswitches.
Positioner with remote sensor.
Sensors for supply air pressure and output pressure.
Attachment kit for linear actuators acc. to IEC 534/NAMUR and rotary actuators acc. to VDI/VDE 3845.
Connection manifold with gauges.
Infrared Interface for wireless communication.
Partial Stroke Test (PST) for Emergency Shut Down applications.

TECHNICAL DATA

GENERAL	
Material	Housing: AISI 316L / 1.4404 st. steel, 1,25 mm thick
IP rating	Protection class IP 66 NEMA 4X
Impact Resistance	7 Joule acc. to EN 50014
Pneumatic connections	Female threaded ISO 228 G 1/4”
Electrical connections	M20 x 1,5 Cable glands Screw terminals: max. 2.5 mm²
Weight	Complete positioner: 3,5 kg

AMBIENT CONDITIONS	
Ambient temperature	-40 ºC to 80 ºC

AIR SUPPLY	
Air supply pressure	1,4 to 6 bar *
Supply air quality	According to ISO 8573-1
Max. particle size and density	Class 2
Max. oil contents	Class 3

* 1,4 to 7 bar with spool valve.

HART COMMUNICATION (TWO-WIRE SYSTEM)	
Reverse polarity protection	built-in standard feature
Signal range	4 to 20 mA
Operating range	3.6 to 21 mA
Voltage	12 to 36 V DC (unloaded circuit)
Maximum load	420 Ohms (8.4 V at 20 mA)
Communication signal	HART, 1200 Baud, FSK modulated on 4 to 20 mA

PROFIBUS-PA	
Data transfer	acc. to PROFIBUS- PA profile class B based on EN 50170 and DIN 19245 part 4

FOXCOM COMMUNICATION (DIGITAL OPERATING MODE)	
Input signal	digital
Supply voltage	13 to 36 V DC
Supply current	~ 9 mA at 24 V DC
Communication signal	FoxCom digital, 4800 Baud, FSK modulated on supply Voltage

INPUT SIGNAL	
Stroke range	8 to 260 mm
Angular range	Up to 95º

Remark: All “intelligent” versions are suplied with micro controller.

RESPONSE CHARACTERISTIC	
Sensitivity	< 0,1% of travel span
Non-linearity (terminal based adjustment)	< 0,4 % of travel span
Hysteresis	< 0,3 % of travel span
Supply air dependency	< 0,1 % / 1 bar
Temperature effect	< 0,3 % / 10 K
Mechanical effect	10 to 60 Hz up to 0,14 mm, 60 to 500 Hz up to 2 g: < 0,25 % of travel span

FIELDBUS COMMUNICATION (ACC. TO FISCO)	
Input signal	digital fieldbus
Supply voltage	9 to 32 V DC
Operating current	10.5 mA ±0.5 mA (base current)
Current amplitude	±8 mA
Fault current	base current +0 mA (+4 mA by means of independent FDE-safety circuit)

FOUNDATION FIELDBUS H1	
Data transfer	FF Specification Rev. 1.4, Link-Master (LAS)
Function blocks	AO, PID, Transducer, Resource, 2 x DI, DO

WITHOUT COMMUNICATION (4 TO 20 MA - TWO-WIRE SYSTEM)	
Reverse polarity protection	built-in standard feature
Signal range	4 to 20 mA
Operating range	3,8 to 21,5 mA
Voltage	DC 8 to 36 V (unloaded circuit)
Maximum load	300 Ohms (6 V at 20 mA)

Remarks: For full product specifications, including requirements for use in potentially explosive atmospheres, different communication protocols (Profibus PA and FOUNDATION Fieldbus-H1) and others, please consult.

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IS PI991.10 E 05.11

ELECTRO-PNEUMATIC POSITIONERS
TZIDC

DESCRIPTION

The ADCATrol TZIDC is a digital intelligent electronically configurable positioner with communication capabilities designed for mounting to 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 final control element yield considerable time savings and an optimal control behaviour.

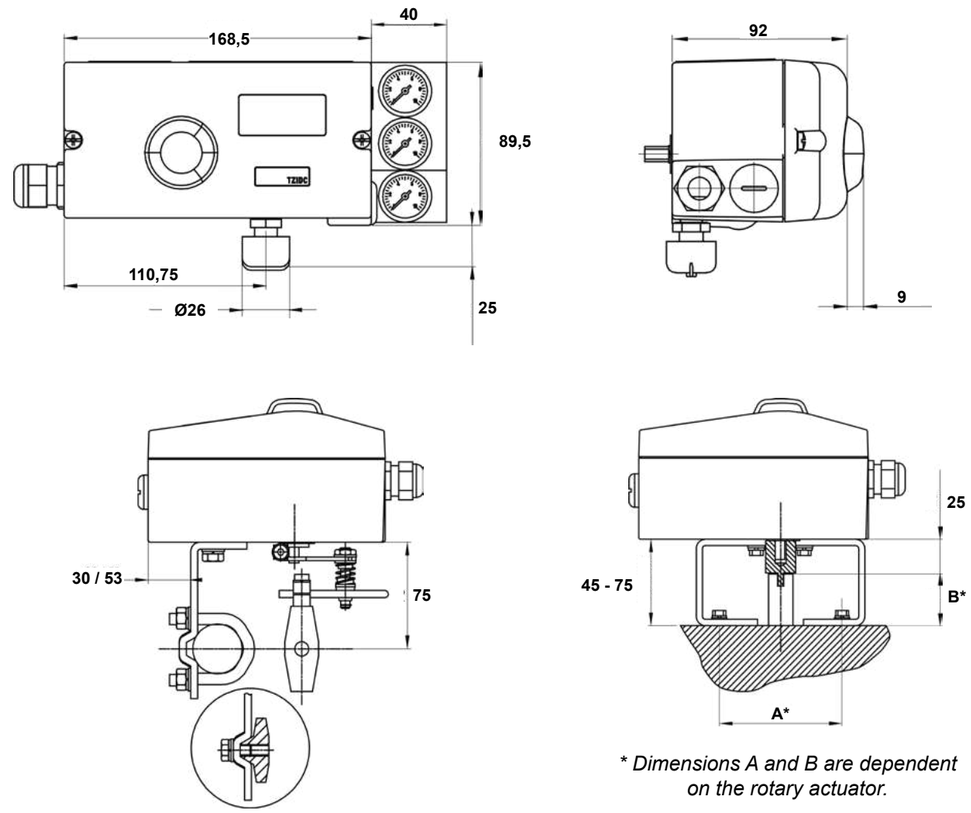
MAIN FEATURES

Low operating cost.
Compact and flexible design.
Easy to comission with user-friendly interface.
Increased shock and vibration resistance with gearless sensor activation.
Reliable and efficient, with integrated maintenance-friendly air filters.
Automatic adjustment of control parameters during operation.
Integrated mechanical position indicator.
Wide operating temperature range (-40 to +85 ºC).
Mounting onto any linear or rotary actuator.
Single or double acting.

OPTIONS AND ACCESSORIES:
HART, Profibus PA or FOUNDATION Fieldbus-H1 communication.
ATEX, FM, CSA, GOST and IECEx approvals.
SIL2 certification.
Module for analog position feedback.
Digital position feedback with inductive proximity switches.
Digital position feedback with 24 V microswitches.
Positioner with remote sensor.
Attachment kit for linear actuators acc. to IEC 534/ NAMUR and rotary actuators acc. to VDI/VDE 3845.
Connection manifold with gauges.
PC adapters for communication.
PC software for remote configuration and operation.

AVAILABLE MODELS: TZIDC.

DIMENSIONS (mm)



** Dimensions A and B are dependent on the rotary actuator.*

TECHNICAL DATA

GENERAL	
Material	Aluminum with ≤ 0.1% copper
IP rating	Protection class IP 65 (IP 66 on request) NEMA 4X
Surface	Electrostatic dipping varnish with epoxy resin, stove-hardened
Pneumatic connections	Female threaded ISO 228 G 1/4”
Electrical connections	M20 x 1,5 Cable glands Screw terminals: max. 1.0 mm² for options max. 2.5 mm² for bus connector
Weight	1,7 kg
Mounting orientation	Any

DIRECTIVES AND COMMUNICATION	
Directives	Compliant with: - EMC directive 2004/108/EC from 12/2004 - EC Directive for CE conformity marking
Communication	- HART® protocol 5.9 as standard, optionally HART® protocol 7.4 - Profibus PA - FOUNDATION Fieldbus H1 - Local connector for LCI (not in explosion protection area) - HART communication via 20 mA signal line with (optional) FSK modem

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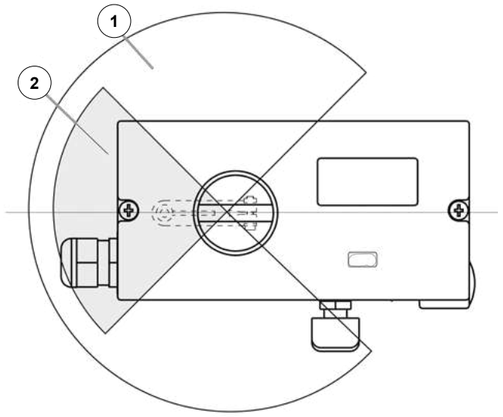
TRAVEL	
Rotation angle	
Measuring range	270º
Working range (Fig.1)	Linear actuators: min. 25º, max. 45º
	Rotary actuators: min. 25º, max. < 270º
Travel limit	Min. and max. limits, freely configurable between 0 to 100% of total travel (min. range > 20%)
Travel prolongation	Range of 0 to 200 s, separately for each direction
Dead band time limit	Setting range of 0 to 200 s (monitoring parameter for control until the deviation reaches the dead band)



1 *Measuring range*

2 *Operating range*

Fig. 1 – Measuring and operating ranges

AIR SUPPLY *	
Purity	Max. particle size: 5 µm Max. particle density: 5 mg/m³
Oil content	Max. concentration: 1 mg/m³
Pressure dew point	10 K below operating temp
Supply pressure **	1.4 to 6 bar
Air consumption ***	< 0.03 kg/h / 0.015 scfm

* Free of oil, water and dust, according to DIN/ISO 8573-1. Pollution and oil content according to Class 3.

** Do not exceed the maximum operating pressure of the actuator!

*** Independent of supply pressure.

TRANSMISSION DATA AND CONTRIBUTING FACTORS	
Output Y1	
Increasing	Increasing setpoint signal 0 to 100% Increasing pressure at output
Decreasing	Increasing setpoint signal 0 to 100% Decreasing pressure at output
Action (setpoint signal)	
Increasing	Signal 4 to 20 mA = Position 0 to 100%
Decreasing	Signal 20 to 4 mA = Position 0 to 100%

Characteristic curve (travel = f {setpoint signal}) *	
Deviation	≤ 0.5%
Tolerance band	0,3 to 10%, adjustable
Dead band	0,1 to 10%, adjustable
Resolution (A/D conversion)	> 16,000 steps
Sample rate	20 ms
Influence of ambient temp.	≤ 0.5% per 10 K
Reference temperature	20 ºC
Influence of vibration	≤ 1% to 10 g and 80 Hz
Seismic vibration	Meets requirements of DIN/IEC 68-3-3 Class III for strong and strongest earthquakes

* Linear, equal percentage 1:25 or 1:50 or 25:1 or 50:1 and freely configurable with 20 reference points

AMBIENT CONDITIONS	
Ambient temperature	
During operation, storage and transport	-40 ºC to 85 ºC -25 ºC to 85 ºC -40 ºC to 100 ºC *
Relative humidity	
Operation (closed housing and air supply switched on)	95% (annual average), condensation permissible
Transport and storage	75% (annual average), non-condensing.

* Increased temperature range only with TZIDC Remote Sensor.

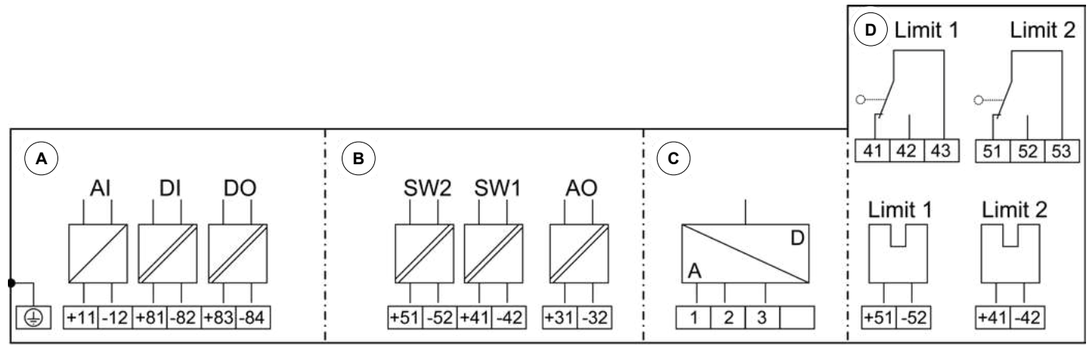
SAFETY INTEGRITY LEVEL	
TZDIC meets the following requirements	- Functional safety acc. to IEC 61508 - Explosion protection (depending on the model) - Electromagnetic compatibility acc. to EN 61000

Without the input signal, the pneumatic module in the positioner vents the drive and the installed spring in it moves the valve to a predetermined end position (OPEN or CLOSED).

SIL specific safety-related characteristics				
Device	**SFF**	**PFDav**	$\lambda_{dd} + \lambda_s$	λ_{du}
TZDIC with supply current 0 mA	94%	1.76×10^{-4}	651 FIT	40 FIT

Remarks: Applies to applications with single-acting and depressurizing pneumatics.

ELECTRICAL CONNECTIONS
Positioner / TZIDC control unit connections



A Basic device

B Options

C Connection TZIDC Remote Sensor / remote position sensor (only for TZIDC Control Unit version)

D Limit value monitor with proximity switches or microswitches (not for TZIDC Control Unit version)

TERMINALS	
TERMINAL	**DESCRIPTION**
+11 / -12	Analog input
+81 / -82	Binary input DI
+83 / -84	Binary output DO2
+51 / -52	Digital feedback SW1 (optional module)
+41 / -42	Digital feedback SW2 (optional module)
+31 / -32	Analog feedback AO (optional module)
1 / 2 / 3	TZDIC remote sensor *
+51 / -52	Limit switch Limit 1 with proximity switch (optional)
+41 / -42	Limit switch Limit 2 with proximity switch (optional)
41 / 42 / 43	Limit switch Limit 1 with microswitch (optional)
51 / 52 / 53	Limit switch Limit 2 with microswitch (optional)

* Only for options TZIDC Remote Sensor or TZIDC for remote position sensor.

Remarks: The TZIDC can be fitted either with proximity switches or microswitches as limit switches. It is not possible to combine both variants. For the version TZIDC Control Unit with TZIDC Remote Sensor, the limit switches are located in the TZIDC Remote Sensor.

BINARY OUTPUT DO *	
Terminals	+83 / -84
Supply voltage	5 to 11 V DC (Control circuit in accordance with DIN 19234 / NAMUR)
Output “logical 0”	> 0,35 mA to < 1,2 mA
Output “logical 1”	> 2,1 mA
Direction of action	Configurable “logical 0” or “logical 1”

* Output configurable as alarm output by software.

ANALOG INPUT SIGNAL	
Set point signal (two-wire technology)	
Terminals	+11 / -12
Nominal operating range	4 to 20 mA
Split range config.	can be parameterized between 20 and 100% of the nominal operating range
Operating range limits	3.8 to 50 mA
Load voltage	9.7 V at 20 mA
Impedance	485 Ω at 20 mA

DIGITAL INPUT	
Function	- no function - move to 0% - move to 100% - hold previous position - block local configuration - block local configuration and operation - block any access (local or via PC)

BINARY INPUT DI	
Terminals	+81 / -82
Supply voltage	24 V DC (12 to 30 V DC)
Input “logical 0”	0 to 55 V DC
Input “logical 1”	11 to 30 V DC
Input current	Maximum 4 mA

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OPTIONAL MODULES

MODULE FOR ANALOG FEEDBACK AO *	
Terminals	+31 / -32
Signal range	4 to 20 mA (split ranges can be parameterized)
Supply voltage (two-wire technology)	24 V DC (11 to 30 V DC)
Characteristic curve	Rising or falling (configurable)
Deviation	< 1%

Remarks: Without any signal from the positioner (e.g. “no power”, “initializing”, or in the event of an error), the module sets the output to >20 mA (alarm level).

MODULE FOR DIGITAL FEEDBACK SW1, SW2 *	
Terminals	+41 / -42 and +51 / -52
Supply voltage	5 to 11 V DC (Control circuit in accordance with DIN 19234 / NAMUR)
Output “logical 0”	< 1.2 mA
Output “logical 1”	> 2.1 mA
Direction of action	Configurable “logical 0” or “logical 1”
Description	2 software switches for binary position feedback (position adjustable within the range of 0 to 100%, ranges cannot overlap).

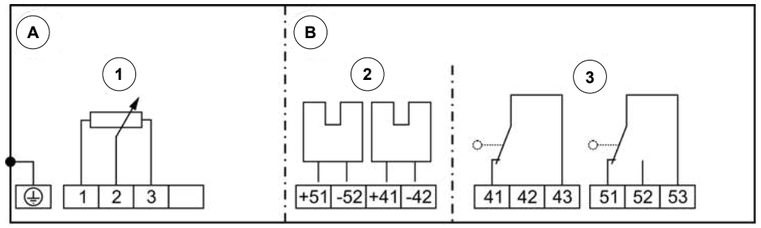
* The module for analog feedback and the module for digital feedback have separate slots and can be used together.

Assembly kits for limit monitor: Two proximity switches or microswitches for independent signaling of the actuator position, switching points are adjustable between 0 to 100%

LIMIT MONITOR WITH PROXIMITY SWITCHES 1, 2		
Terminals	+41 / -42 and +51 / -52	
Supply voltage	5 to 11 V DC (Control circuit in accordance with DIN 19234 / NAMUR)	
Direction of action	Metal tag in proximity switch	Metal tag outside proximity switch
Type SJ2-SN (NC)	< 1.2 mA	> 2.1 mA

LIMIT MONITOR WITH 24V MICROSWITCHES 1, 2	
Terminals	+41 / -42 and +51 / -52
Supply voltage	Maximum 24 V AC/DC
Load rating	Maximum 2 A
Contact surface	10 µm Gold (AU)

TZIDC Remote sensor electrical connections



- (A) Basic device
- (B) Options
- (1) Position sensor
- (2) Limit monitor with proximity switches (optional)
- (3) Limit monitor with microswitches (optional)

TERMINALS	
TERMINAL	**DESCRIPTION / CONNECTION**
1 / 2 / 3	TZIDC control unit
+51 / -52	Proximity switches Limit 1 (optional)
+41 / -42	Proximity switches Limit 2 (optional)
41 / 42 / 43	Microswitches Limit 1 (optional)
51 / 52 / 53	Microswitches Limit 2 (optional)

Remarks: The TZIDC Remote Sensor can be fitted either with proximity switches or microswitches as limit switches. It is not possible to combine both variants.

Remark: For full product specifications, including requirements for use in potentially explosive atmospheres, different communication protocols (Profibus PA and FOUNDATION Fieldbus-H1) and others, please consult.

PNEUMATIC POSITIONERS
PP981

DESCRIPTION

The ADCATrol PP981 is a pneumatic positioner used for direct operation of pneumatic linear or rotary actuators by means of pneumatic controllers with a 0,2 to 1 bar proportional control signal. The positioner compares the output signal from a controller with the position feedback, and varies a pneumatic output signal to the actuator accordingly. The actuator position is therefore guaranteed for any controller output signal and the effects of varying differential pressure.
The positioner features a compact design and a modular construction which allows easy attachment of options such as limit switches, analog feedback modules, manifolds, volume boosters, amongst others.

MAIN FEATURES

Compact and flexible design.
Mounting onto any linear or rotary actuator.
Single or double acting.
Supply pressure up to 6 bar.
Adjustable amplification and damping.
Independent adjustment of stroke range and zero position.
Resistant to vibration effect in all directions.
ATEX approvals.

OPTIONS AND ACCESSORIES

Module for analog position feedback.
Digital position feedback with inductive switches (two or three-wire system).
Digital position feedback with microswitches.
Attachment kit for linear actuators acc. to IEC 534/NAMUR.
Attachment kit with rotary adaptor for rotary actuators acc. to VID/VDE 3845.
Connection manifold with gauges.
Volume boosters.

TECHNICAL DATA

GENERAL	
Material	Housing: Aluminium finished with DD-varnish grey blue; Cover: impact resistant polyester grey blue; Moving parts of feedback system: AISI 303 /1.4305 or AISI 316Ti / 1.4571 Mounting bracket: AISI 304 / 1.4301
IP rating	Protection class IP 54 (IP 65 on request)
Pneumatic connections	Female threaded ISO 228 G 1/8”
Weight	Single acting without gauges: approx. 0,7 kg Single acting with gauges: approx. 0,8 kg Double acting: approx. 0,9 kg Attachment kit: For linear actuators: approx. 0,3 kg For rotary actuators: approx. 0,5 kg

AMBIENT CONDITIONS	
Ambient temperature	-40 ºC to 80 ºC
Relative humidity	Up to 100%
Operating conditions	According to IEC 654-1; The device can be operated at a class D2 location
Transport and storage temperature	-50 ºC to 80 ºC

RESPONSE CHARACTERISTIC *	
Amplification	Adjustable
Sensitivity	< 0,1% F.S.
Non-linearity (terminal based adjustment)	< 1,0 % F.S.
Hysteresis	< 0,3 % F.S.
Supply air dependency	< 0,2 % / 0,1 bar
Temperature effect	< 0,3 % / 10 K

* Data based on the following parameters: stroke 30 mm, feedback lever 117,5 mm, max. amplification, air supply pressure 3 bar.

GAUGES	
Indication range	
Input	0 to 1,6 bar
Output	0 to 10 bar
Error limit	Class 1.6

INPUT SIGNAL	
Signal range	0,2 to 1 bar or split range down to ∆w 0,2 bar
Stroke range	8 to 100 mm
Angular range	Linear: 30 º to 120 º Equal percentage: 90 º; from 70 º linear

OUTPUT SIGNAL	
Output to actuator	0 to 100 % supply air pressure

AIR SUPPLY	
Air supply pressure	1,4 to 6 bar
Supply air	Free of oil, dust or water, according to IEC 654-2

AIR CONSUMPTION	
Single acting	With 1,4 bar air supply: 200 Nl/h
	With 3 bar air supply: 400 Nl/h
	With 6 bar air supply: 600 Nl/h
Double acting	With 1,4 bar air supply: 350 Nl/h
	With 3 bar air supply: 550 Nl/h
	With 6 bar air supply: 750 Nl/h

AIR OUTPUT
Load effect *
-3 % for delivery flow 2350 Nl/h
+3 % for exhausted flow 1900 Nl/h

* Measured with air supply 1,4 bar and 50% of the signal range.

CAPACITY AT MAXIMUM DEVIATION (Nl/h)				
AIR SUPPLY PRESSURE	**1,4 bar**	**2 bar**	**4 bar**	**6 bar**
Without booster	2700	3500	5500	7500
With booster LEXG-FN/GN	18000	24000	40000	55000
With booster LEXG-HN	38000	48000	80000	110000

OPTIONS AND ACCESSORIES

INDUCTIVE LIMIT SWITCH (TWO-WIRE SYSTEM)	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 inductive proximity sensors acc. to DIN 19 234 resp. NAMUR for connection to a switching amplifier with an intrinsically safe control circuit **a)**
Current consumption	Vane clear: > 3 mA Vane interposed: < 1 mA
Supply voltage	DC 8 V, Ri approx. 1 kΩ
Residual ripple	< 5 %
Permissible line resistance	< 100 Ω
Response characteristic b)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 1 % Switching point repeatability: < 0,2 %
Explosion protection c)	Type of protection: II 2 G EEx ib/ia IIB/IIC T4/T6 Certificate of conformity: PTB 02 ATEX 2153 For operation in certified intrinsically safe circuits with the following maximum values: Umax: 16 V Imax: 25 mA Pmax: 64 mW Internal inductance: 100αH Internal capacitance: 30 nF
Ambient temperature	Temperature class T6: - 40 to 65 °C T1 to T5: - 40 to 80 °C

a) For the standard version one switching amplifier is required. For the security version, a fail-safe amplifier for each inductive proximity sensor is required; Operating mode minimum (= low) / maximum (= high) selectable by adjustment of switch vanes; Operating mode normally closed circuit / normally open circuit selectable at switch amplifier output.
b) For feedback lever effective length 117,5 mm, stroke 30 mm (1,28 in) and maximum gain.
c) National installation regulations must be observed;
For retrofitting the product must be tested by a qualified inspector as a special version in accordance with ElexV.

LIMIT SWITCH ASSEMBLY WITH MICROSWITCHES	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 micro switches **f)**
Connected load, alternating current	Switching capacity: max. 250 VA Switching voltage: max. 250 V Switching current with ohmic resistance: max. 5 A Inductive resistance: max. 2 A Bulb, metal filament: max. 0,5 A
Connected load, direct current (refer to the following table)	

Switching voltage, max. (V)	Ohmic load (A)	Inductive load (A)
30	5	3
50	1	1

Response characteristic g)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 2,5 % Switching point repeatability: < 0,2 %

f) Operating mode minimum (= low) / maximum (= high) selectable by adjustment of switch vanes; Contact closed within the positive range.
g) For feedback lever effective length of 117,5 mm, stroke 30 mm and maximum gain.

INDUCTIVE LIMIT SWITCH (THREE-WIRE SYSTEM)	
Input	Stroke / angle from actuator via positioner feedback lever
Output	2 inductive proximity sensors, three-wire system, LED indication, contact, pnp **d)**
Supply voltage U_S	DC 10 to 30 V
Residual ripple	± 10 %, U_S = 30 V
Switching frequency	2 kHz
Constant current	100 mA
Response characteristic e)	Gain: continuously adjustable from 1:1 to approx. 7:1 Switching differential: < 1 % Switching point repeatability: < 0,2 %

d) Operating mode minimum (= low) / maximum (= high) selectable by adjustment of switch vanes; Contact closed within the positive range.
e) For feedback lever effective length 117,5 mm, stroke 30 mm and maximum gain.

ANALOG POSITION FEEDBACK	
Sensor	Resistive precision conductive plastic element.
Input	Stroke/angle from actuator via position feedback lever; Stroke range: 15 to 80 mm (< 15 mm on request) Angular range: 60º to 120º
Output	Two-wire system; Signal range: 4 to 20 mA
Permitted load	R_{Bmax} = (U_S - 12 V) / 0,02A (U_S = Supply voltage)
Power supply	Supply voltage: DC 12 to 36 V Permitted ripple: < 10 % p.p. Supply voltage dependency: < 0,2 %
Response characteristic h)	Non-linearity with terminal based setting: < 1,0 % F.S Hysterisis: < 0,5 % F.S. External resistance dependency: < 0,2 % / $\Delta R_{B\,max}$ Temperature effect: < 0,3 % / 10 K
Explosion protection i)	Type of protection: II 2 G EEx ib/ia IIB/IIC T4/T6 Certificate of conformity: PTB 02 ATEX 2153 For operation in certified intrinsically safe circuits with the following maximum values: Umax: T4: 30 V; T6: 22 V Imax: T4: 130 mA ; T6: 66 mA Pmax: T4: 0,9 W ; T6: 0,5 W Internal inductance: 9 µH Internal capacitance: to earth 10 nF or 6 nF differential
Ambient temperature	Temperature class T6: - 40 to 40 °C Temperature class T5: - 40 to 55 °C Temperature class T4: - 40 to 80 °C

h) For feedback lever effective length of 117,5 mm, stroke 30 mm and maximum gain.
i) National installation regulations must be observed; For retrofitting the product must be tested by a qualified inspector as a special version in accordance with ElexV.

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IS PP981.10 E 13.08

COMMON DATA FOR OPTIONS AND ACCESSORIES

GENERAL

IP rating	Protection class IP 54; IP 65 on request
Mounting	Attachment to positioner
Electrical connections	Line entry: 1 or 2 cable glands M20 x 1,5 (others with Adapter AD-...) Cable diameter: 6 to 12 mm Screw terminals: max. 2.5 mm² (AWG14)
Materials	Base plate: galvanized steel Control vane: alluminium Setting mechanism: fibre glass-reinforced polyamide

AMBIENT CONDITIONS

Ambient temperature j)	- 25 to 80 °C; - 40 to 80 °C
Relative humidity	Up to 100%
Operating conditions	According to IEC 654-1; The device can be operated at a class D2 location
Transport and storage temperature	- 40 °C to 80 °C

j) Without explosion protection; - 40 to 80 °C for the fail-safe version of inductive limit switch.

CE MARKING

Electromagnetic compatibility	89/336/EWG
Low-voltage regulation	w/o Ex: 73/23/EWG (with Ex: not applicable)

ELECTROMAGNETIC COMPATIBILITY (EMC)

Operating conditions	Industrial environment
Immunity	Acc. to NAMUR recommendation NE21, EN 61326 and EN 61000-6-2
Emission	According to EN 55011, Group 1, Class A and EN 61000-6-2

SAFETY

Acc. to DIN EN 61010-1 (DIN IEC 61010-1) (VDE 0411 part 1)	safety class III; over voltage category I; internal fuses: none; external fuses: Limitation of power supplies for fire protection has to be observed due to EN 61010-1 9.3.

ELECTRO-PNEUMATIC CONVERTERS
PC25

DESCRIPTION

The ADCATrol PC25 is a compact device which converts a standard analog signal to a standard pneumatic signal, for the change-over between electrical controllers to pneumatic control valves, or from electrical measuring systems to pneumatic controllers.
The PC25 is a force balance device, which converts a 4 to 20 mA input signal into a proportional linear 0,2 to 1 bar output signal, with a respective supply pressure of 1,7 to 5 bar.

MAIN FEATURES

Particularly compact design.
Good dynamic response.
Immune to mechanic vibrations.
Low maintenance and low consumption.
High reliability.
Adjustable output measuring span.

OPTIONS: Pressure gauge on body.
Other output pressure ranges.

AVAILABLE MODELS: PC25.

SIZES: 1/4".

CONNECTIONS: Female threaded NPT.

INSTALLATION: In any position.
See IMI – Installation and maintenance instructions.

TECHNICAL DATA

GENERAL

Operating temperature	-40 to +85 °C
IP rating	IP 65
Electric connections	DIN 43650, form A
Pneumatic connections	Female threaded 1/4" NPT
Material	Passivated zinc die-casting epoxy painted, NBR diaphragms, Glass reinforced PA cover.
Operating position	Any
Weight	1 kg

ANALOG INPUT SIGNAL

Nominal operating range	4 to 20 mA
Impedance	11 kΩ at 20 mA
Span/zero	Up to 20% of output range, adjustable
Failure mode	Output pressure fails to zero signal state

AIR SUPPLY *

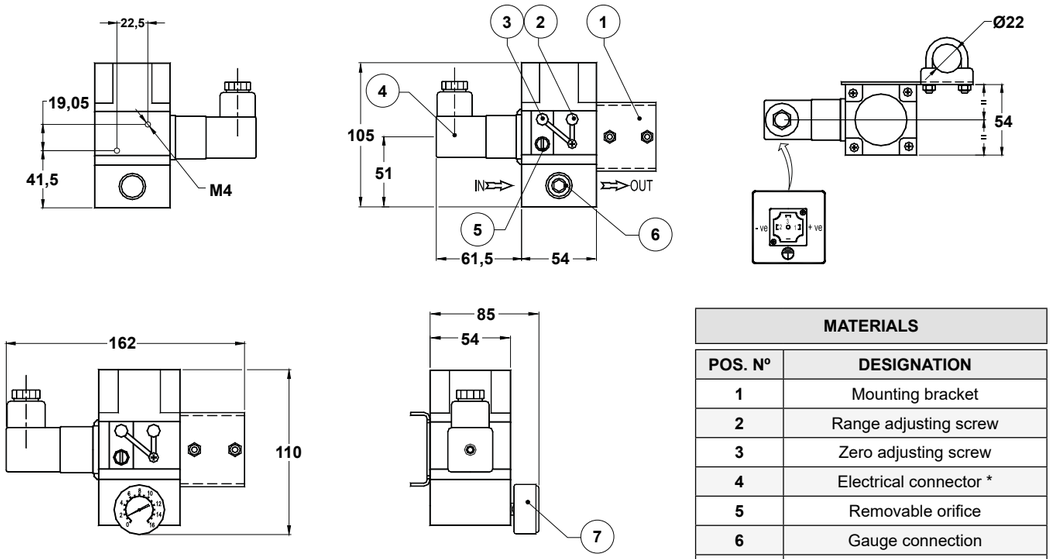
Purity	Max. particle size: 5 µm Max. particle density: 5 mg/m³
Oil content	Max. concentration: 1 mg/m³
Supply pressure **	1,7 to 5 bar
Air consumption	2,8 Nl/min @ 1 bar

* Free of oil, water and dust, according to DIN/ISO 8573-1.
** Do not exceed the maximum operating pressure of the actuator!

PNUEMATIC OUTPUT SIGNAL

Output pressure	0,2 to 1 bar (others on request)
Flow capacity	> 300 Nl/min, forward & relief
Linearity	≤ 0,5% of span
Hysteresis	≤ 0,5% of span
Response time	< 0,5 seconds for a 10 to 90% or 90 to 10% of output pressure into a 10cc load
Supply sensitivity	<0,075% span output change per % supply pressure change

DIMENSIONS (mm)



MATERIALS	
POS. Nº	**DESIGNATION**
1	Mounting bracket
2	Range adjusting screw
3	Zero adjusting screw
4	Electrical connector *
5	Removable orifice
6	Gauge connection
7	Pressure gauge *
8	Filter regulator

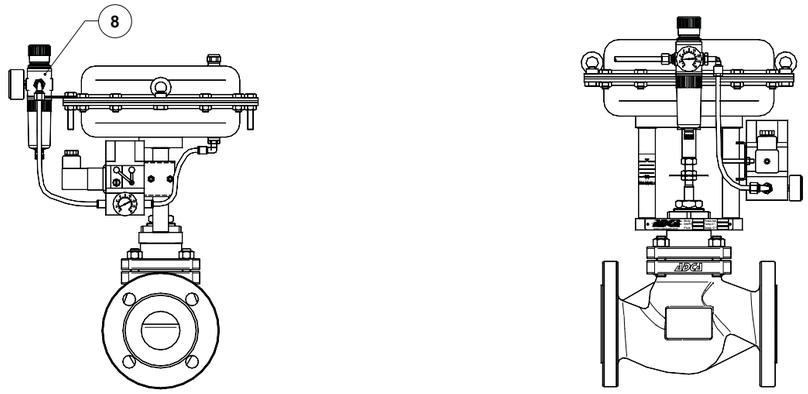
* Optional.

CALIBRATION

When the instrument is first installed or after a long downtime period, a moderate zero shift is normal. This is due to the rubber diaphragms which are stretched by the internal springs. After a few operations, the instrument will settle into its normal operating condition. In these circumstances, the instrument should be put to work by alternately applying zero and full scale signals several times. Zero calibration should then be carried out.
Adjust zero control nº2 (anti-clockwise) to give minimum required output pressure.
Adjust range control nº3 (anti-clockwise) to give maximum required output pressure.

Note: Reverse acting operation.
About 20 turns of the zero screw may be required to reset the zero point.

TYPICAL INSTALLATION



AIR FILTER REGULATOR
P10

ADCATrol

DESCRIPTION

The P10 air filter regulators are used to remove both solid and liquid impurities from the air and to regulate the output pressure to the required value for general purpose pneumatic systems.
The filter bowl is transparent, allowing easy monitoring of the condensate level.

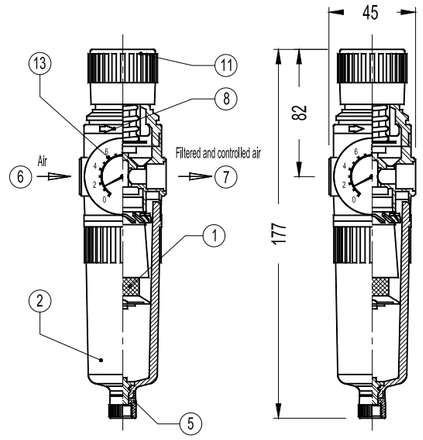
MAIN FEATURES

Self relieving.
Compact combined filter/regulator.
5 micron large surface area element.
Manual and automatic condensate exhaustion are easier when there is no pressure.
Pressure gauge D.42 x 1/8”
Mounting bracket.

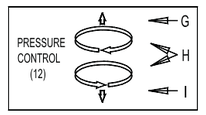
USE: Pneumatic systems.

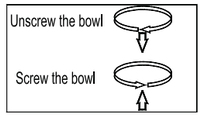
AVAILABLE MODELS: P10 – alluminium and polycarbonate.

SIZE AND CONNECTION: Female threaded ISO 7 Rp 1/4”.



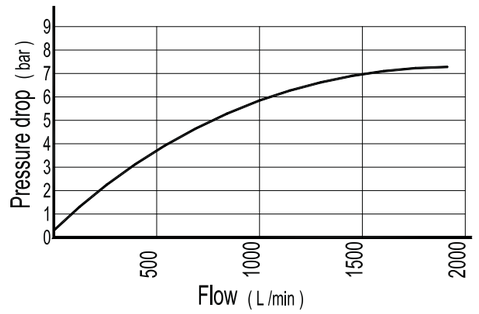
LIMITING CONDITIONS	
Valve model	**P10**
Maximum upstream pressure	12 bar
Maximum downstream pressure	10 bar
Minimum downstream pressure	0,5 bar
Maximum design temperature	60 ºC
Minimum operating temperature	-10 ºC





MATERIALS	
POS. Nº	**DESIGNATION**
1	Filtering element
2	Bowl (with bowl guard included)
5	Exhaust ring
6	Air inlet connection
7	Low pressure air outlet
8	Flow indicator arrow
11	Pressure regulating knob
13	Pressure gauge

* Available spare parts.



UNIVERSAL PROCESS CONTROLLERS
UC-820

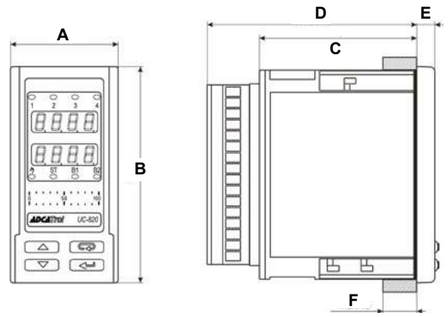
DESCRIPTION

The ADCATrol UC-820 is a digital universal controller used in the automation of industrial processes. It is ideally suited for use with our range of instrumentation, electric and pneumatic control valves and other electrical equipment.
The controller includes a set of universal type inputs for RTD, thermocouple (TC), logic (binary) and analog inputs. The controller has options for relay, open-collector (OC) and analog outputs using the innovative SMART PID algorithm.

MAIN FEATURES

Universal measuring input: Resistance thermometer (RTD), thermocouples (TC), 0(4) to 20 mA and 0 to 5/10 V.
Set point value: constant, programmed or from the additional analog input.
On/off, PID, PID three-step and two-step control (valve control) or PID of heating-cooling type.
2 NO relay alarm outputs and 2 other outputs of choice between relay, OC or analog outputs (0/4 to 20 mA or 0 to 10 V).
Binary input control.
Soft-start function.
8 types of alarm functions.
24 V DC supply output to power transmitters and others.
Signal retransmission.
“Gain scheduling” and timer functions.
Auto-tuning using the smart PID algorithm.
Galvanically isolated inputs and outputs.
Password protection.
Fully programmable from the front panel.
RS-485 Modbus RTU communication.
IP rating IP 65.

AVAILABLE
MODELS: UC-820.



DIMENSIONS (mm)							
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**WEIGHT (kg)**
UC-820	48	96	93	70	8	15	0,2

TECHNICAL DATA

GENERAL	
Supply voltage	85 to 253 V AC/DC or 20 to 40 V AC/DC
Ambient temperature	0 to 55 ºC
Storage temperature	-20 to +70 ºC
Humidity	< 85%, non condensing
IP rating	IP 65 (front); IP 20 (rear)
Material	Housing in PC/ABS
Front panel	96 x 48 mm (cutout: 92 x 45 mm)
Operating position	Any
External magnetic field	0 to 400 A/m

OUTPUTS	
Relay	NO volt free contacts, 2 A @ 230 V AC
	2 change-over volt free contacts 0.5 A @ 230 V AC
OC open-collector	0/5 V, passive NPN, 40 mA max.
Continuous voltage	0 to 10 V, 1 kΩ min.
Continuous current	0(4) to 20 mA, 500 Ω max.
Transducer supply	24 V DC, 30 mA max.

DIGITAL INTERFACE	
Interface type	RS-485
Protocol	Modbus RTU 8N2, 8E1, 8O1, 8N1
Baud rate	4.8, 9.6, 19.2, 38.4, 57.6 kbit/s

INPUTS	
PT100	-200 to 850 ºC, 0,2% error
PT1000	-200 to 850 ºC, 0,2% error
Fe-CuNi (J)	-100 to 1200 ºC, 0,3% error
Cu-CuNi (T)	-100 to 400 ºC, 0,3% error
NiCr-NiAl (K)	-100 to 1372 ºC, 0,3% error
PtRh10-Pt (S)	0 to 1767 ºC, 0,5% error
PtRh13-Pt (R)	0 to 1767 ºC, 0,5% error
PtRh30-PtRh6 (B)	200 to 1767 ºC, 0,5% error
NiCr-CuNi (E)	-100 to 1000 ºC, 0,3% error
NiCrSi-NiSi (N)	-100 to 1300 ºC, 0,3% error
Current input (I)	0(4) to 20 mA, 0,2% ± 1 digit error
Voltage input (U)	0 to (5)10 V, 0,2% ± 1 digit error
Binary	Voltageless
Additional current input	0(4) to 20 mA, 0,2% ± 1 digit error

SAFETY AND COMPATIBILITY REQUIREMENTS	
Electromagnetic compatibility	Noise immunity acc. to EN 61000-6-2
	Noise emissions acc. to EN 61000-6-4
Pollution level	Level 2 acc. to EN 61010-1
Installation category	Cat. III acc. to EN 61010-1
Maximal phase-to-earth operating voltage	Supply circuit: 300 V; Remaining circuits: 50 V acc. to EN 61010-1

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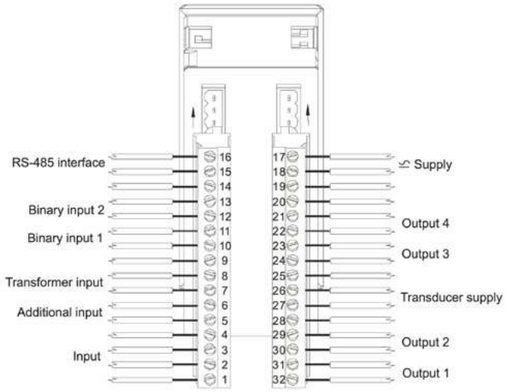
IS UC820.10 E 08.17

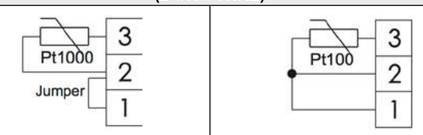
ELECTRICAL CONNECTIONS

TERMINAL STRIP

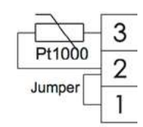


CONNECTION OF INPUT SIGNALS

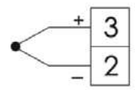
PT100 (2 OR 3 WIRE)



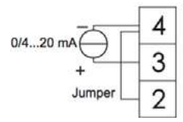
PT1000



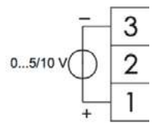
THERMOCOUPLE



CURRENT INPUT

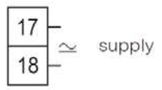


VOLTAGE INPUT

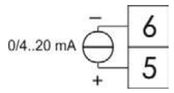


OTHER CONNECTIONS

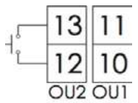
POWER SUPPLY



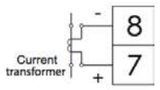
ADDITIONAL ANALOG INPUT SIGNAL



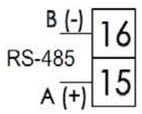
BINARY INPUT 1 AND 2



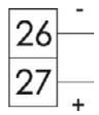
CURRENT TRANSFORMER INPUT



RS-485 INTERFACE

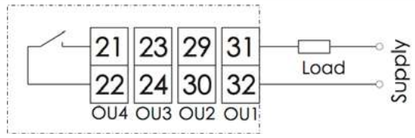


24V TRANSDUCER SUPPLY

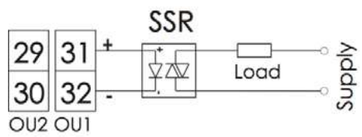


CONTROL/ALARM OUTPUT SIGNALS

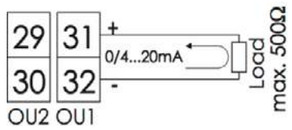
OUTPUT 1, 2, 3, 4: RELAY



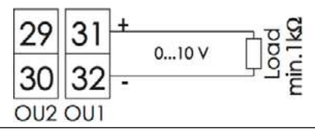
OUTPUT 1, 2: VOLTAGE 0/5 V (SSR)



OUTPUT 1, 2: CONT. CURRENT 0/4 to 20 mA



OUTPUT 1, 2: CONT. VOLTAGE 0 to 10 V



ORDERING CODES UC-820

Group designation	UC820	.1	3	1	.1
Universal process controller	UC820				
Output 1					
Relay		.1			
OC open collector 0/5 V		.2			
Continuous current 0(4) to 20 mA		.3			
Continuous voltage 0 to 10 V		.4			
Output 2					
Relay **a)**			1		
OC open-collector 0/5 V			2		
Continuous current 0(4) to 20 mA			3		
Continuous voltage 0 to 10 V			4		
24 V Transducer supply					
24 V DC supply for transducers,1 W				1	
Power supply					
85 to 253 V AC/DC					.1
20 to 40 V AC/DC					.2

a) Only admissible when a relay or OC voltage output is selected on output 1.

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IS UC820.10 E 08.17

UNIVERSAL DISPLAY
UD-720

DESCRIPTION

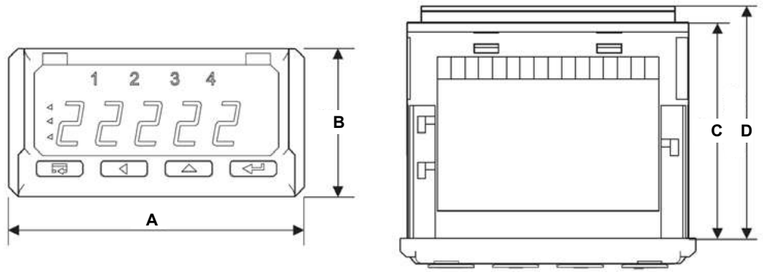
The ADCATrol UD-720 is a programmable digital panel display used for the measurement of standard sensor and analog signals applied in automation. It is ideally suited for use with our range of instrumentation such as pressure transmitters, temperature probes and others. The unit features a 24 V DC supply output for transmitters.

MAIN FEATURES

Easy to comission with user-friendly interface.
Measuring inputs for resistance thermometer (RTD), thermocouples (TC), 0(4) to 20 mA, 0 to 10 V, 0 to 60 mV and resistance (Ω).
2 NO relay alarm outputs.
6 types of alarm functions.
24 V DC supply output to power transmitters and others.
Three color display (14 mm high) with programmable color settings based on the measured value.
21-point individual characteristic function for input rescaling and conversion.
Galvanically isolated inputs and outputs.
Fully programmable from the front panel.
Password protection.
IP rating IP 65.

OPTIONS: Change-over relay alarm outputs.
0(4) to 20 mA and 0 to 10 V outputs for retransmission of any of the measured inputs.
RS-485 Modbus RTU communication.

AVAILABLE MODELS: UD-720.



DIMENSIONS (mm)					
MODEL	**A**	**B**	**C**	**D**	**WEIGHT (kg)**
UD-720	96	48	67	93	0,2

TECHNICAL DATA

GENERAL	
Supply voltage	85 to 253 V AC/DC or 20 to 40 V AC/DC
Ambient temperature	-25 to +55 ºC
Storage temperature	-30 to +70 ºC
IP rating	IP 65 (front); IP 10 (rear)
Material	Housing in PC/ABS
Humidity	< 85% without condensation
Front panel	96 x 48 mm (cutout: 92 x 45 mm)
Operating position	Any
External magnetic field	0 to 400 A/m

OUTPUTS	
Relay	2 NO volt free contacts, 0,5 A @ 250 V AC
	2 change-over volt free contacts 0.5 A @ 230 V AC
OC open-collector	Passive NPN, 30 mA @ 30 V DC
Continuous voltage	0 to 10 V, 500 Ω min.
Continuous current	0(4) to 20 mA, 500 Ω max.
Transducer supply	24 V DC, 30 mA max.

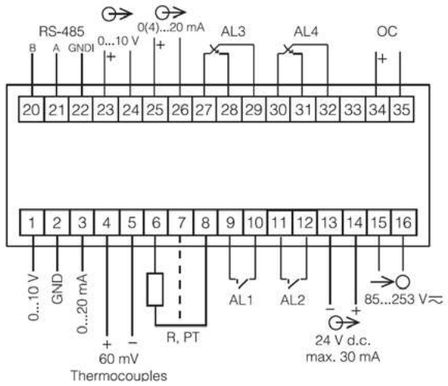
DIGITAL INTERFACE	
Interface type	RS-485
Protocol	Modbus RTU 8N2, 8E1, 8O1, 8N1
Baud rate	4.8, 9.6, 19.2, 38.4, 57.6, 115.2 kbit/s

INPUTS *	
PT100	-200 to 850 ºC
PT500	-200 to 850 ºC
PT1000	-200 to 850 ºC
Fe-CuNi (J)	-100 to 1200 ºC
NiCr-NiAl (K)	-100 to 1372 ºC
PtRh10-Pt (S)	0 to 1767 ºC
PtRh13-Pt (R)	0 to 1767 ºC
NiCr-CuNi (E)	-100 to 1000 ºC
NiCrSi-NiSi (N)	-100 to 1300 ºC
Current input (I)	-20 to 20 mA
Voltage input (U)	-10 to 10 V
mV input (mV)	0 to 60 mV

* Class 0,1.
Additional errors:
Due to automatic compensation of the reference junction temperature: ≤ 1°C.
Due to automatic compensation of the cable resistance for RTDs: ≤ 0.5°C.
Due to automatic compensation of the cables for resistance measurement: ≤ 0.2 Ω.
From temperature changes: 100% of the class / 10 K.

SAFETY AND COMPATIBILITY REQUIREMENTS	
Electromagnetic compatibility	Noise immunity acc. to EN 61000-6-2
	Noise emissions acc. to EN 61000-6-4
Pollution level	Level 2 acc. to EN 61010-1
Installation category	Cat. III acc. to EN 61010-1
Maximal phase-to-earth operating voltage	Supply circuit: 300 V; Remaining circuits: 50 V acc. to EN 61010-1

ELECTRICAL CONNECTIONS



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IS UD720.10 E 08.17

ORDERING CODES UD-720			
Group designation	**UD720**	**.1**	**.0**
UD-720 universal display	**UD720**		
Power supply			
85 to 253 V AC/DC		**.1**	
20 to 40 V AC/DC		**.2**	
Additional outputs			
No additional outputs			**.0**
OC open-collector output, RS-485 and analog outputs			**.1**
OC open-collector output, RS-485, analog outputs and 2 change-over relay outputs			**.2**

PRESSURE TRANSMITTERS
PCS1

DESCRIPTION

The ADCATrol PCS1 is a series of pressure transmitters suitable for all industrial applications. It is specially designed to operate in severe conditions where high temperatures, pressure peaks, shock and vibrations are present.
The PCS1 is extremely robust and reliable, thanks to its state of the art SMD electronics and compact all stainless steel construction.

MAIN FEATURES

Compact stainless steel construction.
Extended process media temperature from -40 ºC to 125 ºC.
2-wire 4 to 20 mA loop output.
Available in multiple pressure ranges.
Accuracy < 0.5% of full scale.
Fast response (< 1 ms).
Capable of withstanding high levels of mechanical shock and vibrations.

OPTIONS: Siphons and connector fitting adaptors for ADCA GS series siphons.
M12 electrical connection with IP 67 rating.

USE: Pressure measurement in pipelines and vessels.

AVAILABLE MODELS: PCS1.

SIZES: 1/4".

CONNECTIONS: Male threaded ISO 228 G.

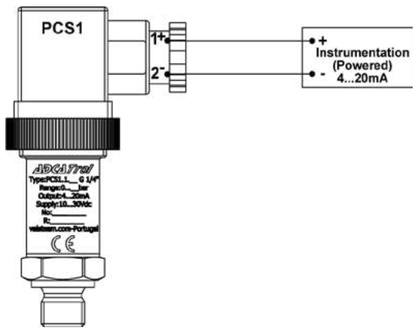
INSTALLATION: In any position.
See IMI – Installation and maintenance instructions.

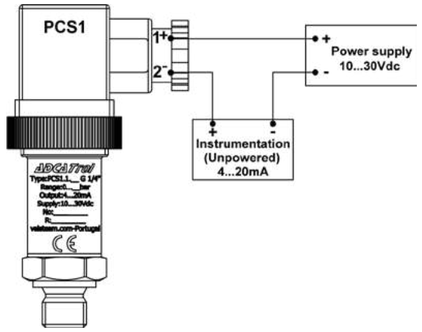
PRESSURE RANGES									
RANGE	**0 to 6 bar**	**0 to 10 bar**	**0 to 16 bar**	**0 to 25 bar**	**0 to 40 bar**	**0 to 100 bar**	**0 to 250 bar**	**0 to 400 bar**	**0 to 600 bar**
Overpressure	12	20	32	50	80	200	500	800	1200
Burst pressure	24	40	64	100	160	400	1000	1500	1500

TECHNICAL DATA	
Non linearity (BFSL)	±0.15% FS; ±0.25% FS (max)
Hysteresis	±0.1% FS; ±0.15% FS (max)
Repeatability	±0.025% FS; ±0.05% FS (max)
Zero offset tolerance	±0.15% FS; ±0.25% FS (max)
Span offset tolerance	±0.15% FS; ±0.25% FS (max)
Accuracy at room temperature **a)**	< ±0.5% FS
Pressure ranges **b)**	See table
Resolution	Infinite
Overpressure (without degrading performance)	See table
Pressure containment (burst test)	See table
Pressure media	Fluids compatible with stainless steel AISI 430F and 17-4 PH
Housing	Stainless steel AISI 304
Power supply	10 to 30 V DC
Dielectric strength	250 V DC
Output	4 to 20 mA (loop powered)
Maximum loop resistance	approx. 700 Ω at 24 V DC, 1000 Ω at 30 V DC
Long term stability	<0.2% FS/per year
Operating temperature range (process)	-40 to +125 ºC (-40 to +257 ºF)
Operating temperature range (ambient)	-40 to +105 ºC (-40 to +221 ºF)
Compensated temperature range	-20 to +85 ºC (-40 to +185 ºF)
Storage temperature range	-40 to +125 (-40 to +257 ºF)
Temperature effects over compensated range (zero)	±0.01% FS/ºC; ±0.02% FS/ºC (max)
Temperature effects over compensated range (span)	±0.01% FS/ºC; ±0.02% FS/ºC (max)
Response time (10...90% FSO)	< 1 ms
Warm-up time **c)**	< 30 s
Mounting position effects	Negligible
Humidity	100% RH non-condensing
Weight	80 to 120 g
Mechanical shock	100 g / 11 ms according to IEC 60068-2-27
Vibrations	20 g max at 10...2000 Hz according to IEC 60068-2-6
IP rating	IP 65 / IP 67
Output short circuit and reverse polarity protection	Yes
EC Conformity	According to directive 2014/30/EU

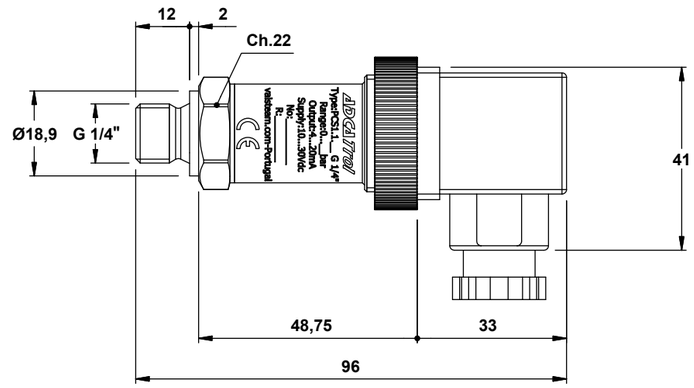
FS = Full Scale.
a) Including Non-linearity, Hysteresis, Repeatability, Zero-offset and Span-offset (acc. to IEC 61298-2).
b) The operating pressure range is intended from 0.5% to 100% FS.
c) Time within the rated performance is achieved.

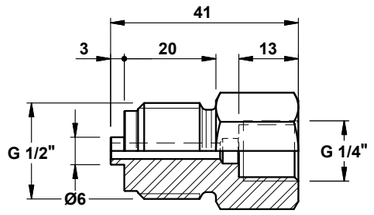
ELECTRICAL CONNECTIONS





DIMENSIONS (mm)





Optional connection fitting adaptor for ADCA GS series siphons

ORDERING CODES PCS1			
Group designation	**PCS1**	**.1**	**.10**
Pressure transmitter	**PCS1**		
Electrical connections			
4-pin DIN connector (EN 175301-803 Form A) IP 65 **a)**		**.1**	
Pressure range			
0 to 6 bar			**.6**
0 to 10 bar			**.10**
0 to 16 bar			**.16**
0 to 25 bar			**.25**
0 to 40 bar			**.40**
0 to 100 bar			**.100**
0 to 250 bar			**.250**
0 to 400 bar			**.400**
0 to 600 bar			**.600**

a) 4-pin male M12x1 connector IP 67 is available under special request.

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IS PCS1.10 E 09.17

DIRECT SOLENOID VALVE
SV32

DESCRIPTION

3/2 way solenoid valves are available as single station units and they are designed for use with compressed air, mainly applied where on-off control is required with pneumatic actuators.

OPTIONS: Other versions under request.

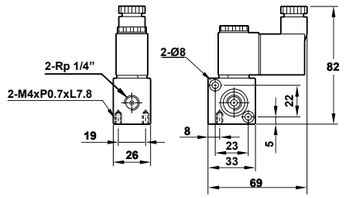
USE: Pneumatic actuator control, among others.

AVAILABLE MODELS: SV32C – direct acting.
SV32H – pilot operated.

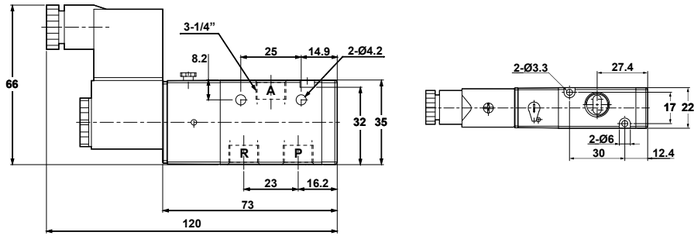
SIZES AND CONNECTIONS: 1/4” female threaded ISO 7 Rp.

INSTALLATION: In any position.
See IMI – Installation and maintenance instructions.

DIMENSIONS



SV32C



SV32H

TECHNICAL DATA		
TYPE	**SV32C**	**SV32H**
Body material	Aluminium alloy	
Sectional area	1,5 mm²	16 mm²
Action	Direct acting with spring return	Internal pilot
Operating pressure	0 to 8 bar	
Maximum proof pressure	10 bar	
Ambient temperature	-10 ºC to 60 ºC	
Duty cycle	100% ED	
Coil type	DIN	
Protection class	IP 65 (DIN 40 050)	
Insulation class	F	
Voltage tolerance	±10%	
Standard voltages	220 V AC, 110 V AC, 24 V DC	
Net weight	0,16 kg	0,18 kg

TDS CONTROLLER FOR STEAM GENERATORS
BCS211

DESCRIPTION

The ADCATrol BCS211 is a TDS controller/limitter specially designed for use with steam generators. The basic system is composed by a SPS series conductivity probe, a BCS211 controller and a VPC series TDS blowdown control valve.

OPERATION

The BCS211 controller continuously measures, at the electrode rod in the measuring cell, the electrical conductivity of the boiler water, which is closely related to the level of TDS.
The measured value is compared with the set point of the controller. If the measured value exceeds the set point, the controller opens the blowdown valve using its relay output (lighting up the “Alarm” indicator lamp).
Once the measured value drops below 78% of the set point, the controller relay is energized, closing the blowdown valve (the “Alarm” indicator lamp turns off).

MAIN FEATURES

Simple design, easy to set.
Compatible with SPS21 and SPS33 series conductivity probes.
Volt-free relay alarm output.
4 to 20 mA analog output for remote monitoring purposes.
Quick performance test by pressing and holding the "TEST K" button.
Assembly in 35 mm rail mounting acc. to DIN EN 50022 or directly screwed on to the chassis plate.

OPTIONS AND ACCESSORIES: Digital displays and process controllers.

AVAILABLE MODELS: BCS211 – 0 to 10000 µs/cm.
BCS211B – 0 to 1000 µs/cm.

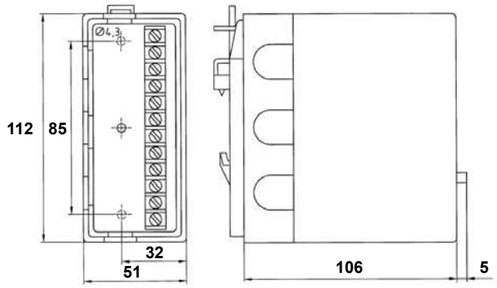
TECHNICAL DATA

GENERAL	
Supply voltage	196 to 265 V AC, 5 W max.
IP rating	IP 40 *
Material	Housing in PC/ABS
Ambient temperature	0 to 60 °C
Fuse	80 mA/T
Component mark (CE)	0035 ** TUV ID: 0000006175

INPUTS AND OUTPUTS	
Conductivity input	0 to 10000 µS/cm (BCS211) 0 to 1000 µS/cm (BCS211B)
Conductivity set point range	1000 to 10000 µS/cm (BCS211) 100 to 1000 µS/cm (BCS211B)
Analog output	4 to 20 mA, non adjustable
Relay output	1 change-over volt free contact 5 A @ 250 V AC

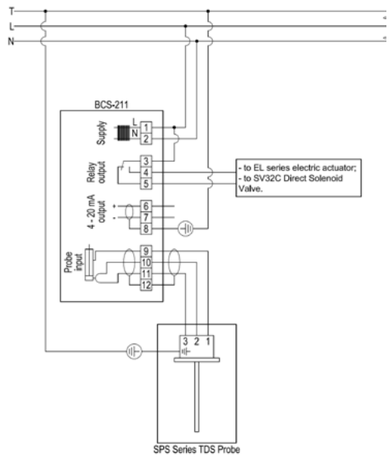
* According to German regulations Vd TUV – Wasserstand 100, 4,90 a protection of IP 54 has to be maintained in the boiler area.
** According to PED directive annex VII (Module B+D, category II).

DIMENSIONS (mm)

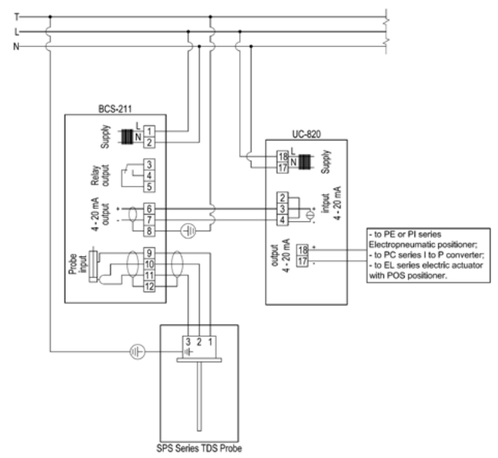


ELECTRICAL CONNECTIONS

RELAY ON/OFF OUTPUT



4 to 20 mA TRANSMITTER OUTPUT



BLOWDOWN CONTROLLER BCS220

DESCRIPTION

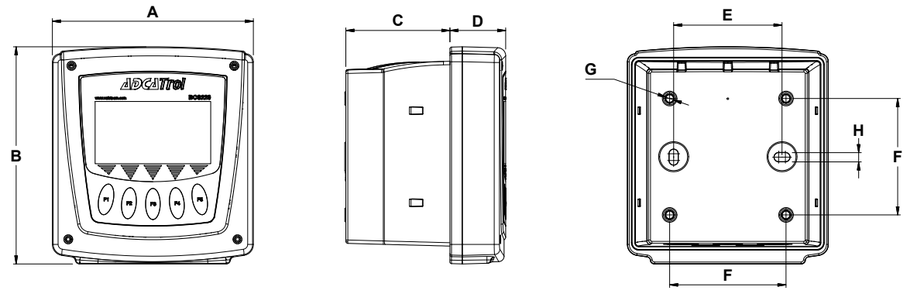
The ADCATrol BCS220 is a blowdown controller specially designed for use with steam boilers. The device takes care of both TDS and intermittent blowdown controls.
TDS (Total Dissolved Solids) is controlled through measurement of the boiler water electrical conductivity and intermittent control is performed via a blowdown timer.
The device utilizes a clear multifunction LCD to display measured conductivity, temperature, operational alarm status and provide an intuitive user interface. The device is IP 66 rated NEMA 4X and can be panel, surface/wall and pipe mounted.

MAIN FEATURES

TDS and intermittent blowdown control in one single device.
Displays conductivity, resistivity, PPM and temperature units.
Programmable cell constant.
Versatile IP 66 NEMA 4X (144 x 144 mm) enclosure design.
Large informative 3,75'' LCD backlit display.
Simple intuitive menu structure with soft tactile function buttons.
Software upgradable via SD card slot – Future proof.
Volt-free outputs with multiple alarm function options.
0(4) to 20 mA analog output for remote monitoring purposes with features including adjustable scaling, selectable on-error states and loop fault detection.
Digital input suitable for connection to the boiler stand-by/burner contact, to reduce energy waste.

OPTIONS AND ACCESSORIES: Panel mounting kit.
Pipe mounting kit (50 to 100 mm pipe OD).

AVAILABLE MODELS: BCS220 – 90 to 265 V AC power supply.
BCS220-LV – 12 to 30 V DC power supply.



DIMENSIONS (mm)									
MODEL	A	B	C	D	E	F	G	H	WEIGHT (kg)
BCS220 BCS220-LV	150	161	77	42	80	86	M4	6,8	0,8