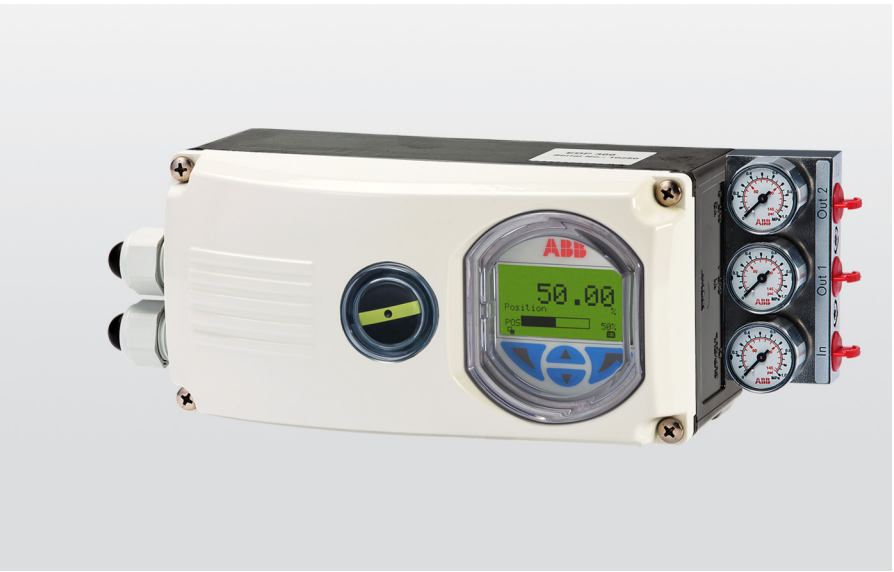
ABB MEASUREMENT & ANALYTICS | OPERATING INSTRUCTION | OI/EDP300-EN REV. H

PositionMaster EDP300

Digital Positioner



Digital Positioner for the positioning of pneumatically controlled final control elements.

EDP300

Introduction

The PositionMaster EDP300 has an integral mount design, features a modular structure and offers an outstanding price-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. Due to its characteristics, the positioner is suited for even the most demanding operating conditions.

Additional Information

Additional documentation on PositionMaster EDP300 is available for download free of charge at www.abb.com/positioners.
Alternatively simply scan this code:

ENGINEERED
TO OUTRUN

Table of contents

1 Safety 4
General information and instructions 4
Warnings 4
Intended use 4
Improper use 4
Warranty provisions 4
Cyber security disclaimer 5
Software downloads 5
Manufacturer's address 5
Service address 5

2 Use in potentially explosive atmospheres in accordance with ATEX and IECEx 6
Product identification 6
Ex marking 6
Mounting 7
Potential equalization 7
Charging processes 7
IP rating 7
Cable gland 7
Operation with flammable gases 8
Operation in areas with combustible dust 8
Operation in temperature class T6 8
ATEX and IECEx temperature data 8
Type of protection Ex i for gas atmosphere, intrinsic safety 8
Type of protection Ex i for dust atmosphere, intrinsic safety 8
Type of protection Ex ec – increased safety, Ex nA - non-sparking 8
Type of protection Ex tb – protection by enclosure 8
ATEX und IECEx electrical data 9
Type of protection Ex i, intrinsic safety 9
Basic device 9
Option modules 9
Type of protection Ex n - non-sparking 10
Basic device 10
Option modules 10
Specific Conditions of Use / Schedule of Limitations 11
Commissioning 12

3 Use in potentially explosive atmospheres in accordance with cFMus 13
Product identification 13
Ex marking 13
Mounting 13
Potential equalization 14
Charging processes 14
Cable gland 14
Operation with flammable gases 14
Operation in areas with combustible dust 14
Operation in temperature class T6 14
Specific Conditions of Use 15
Temperature data 16
Electrical data 16
Intrinsic Safety and NIFW connection values 16
For DIP marking 17
Commissioning 18

4 Use in hazardous areas in accordance with EAC TR-CU-012 19
Product identification 19
Ex marking 19
Mounting 19
Cable gland 19
Operation with flammable gases 20
Operation in areas with combustible dust 20
Operation in temperature class T6 20
Temperature data 20
Type of protection Ex i, intrinsic safety 20
Type of protection Ex n - non-sparking 20
Electrical data EAC TR-CU-012 21
Type of protection Ex i, intrinsic safety 21
Basic device 21
Temperature characteristic curves 21
Option modules 21
Type of protection Ex n - non-sparking 22
Basic device 22
Option modules 22
Commissioning 22

5 Design and function 23
Schematic diagram 23
Principle of operation 23

6 Product identification 24
Name plate 24

7 Transport and storage 25
Inspection 25
Transporting the device 25
Storing the device 25
Ambient conditions 25
Returning devices 25

8 Installation 25
Safety instructions 25
External position sensors 26
Mechanical mounting 27
General 27
Mounting on linear actuators 28
Mounting on control valves 30
Mounting on rotary actuator 31
Installing the option modules 32
Installing the mechanical position indication 33
Installing the mechanical position feedback 33
Installing the pressure option 34
Setting the mechanical position indication 35
Setup of the feedback on the actuator position using proximity switches 36
Setup of the feedback on the actuator position using microswitches 36

9 Electrical connections 37
Safety instructions 37
Potential equalization 37
Positioner / EDP300 Control Unit Electrical Connection 38
EDP300 Remote Sensor Electrical Connection 39
Electrical data for inputs and outputs 40
Basic device 40
Option modules 40
Conductor cross-section 41
Basic device 41
Option modules 41
Connection on the device 42
Connection to device – EDP300 Control Unit with EDP300 Remote Sensor 43
Connection on device – EDP300 Control Unit for remote position sensor 45

10 Pneumatic Connections 46
Information on double acting actuators with spring-return mechanism 46
Connection on the device 46
Air supply 47

11 Commissioning 47
Safety instructions 47
Checks prior to commissioning 47
Mechanical mounting checks 47

12 Operation 49
Safety instructions 49
Parameterization of the device 49
Menu navigation 49
Menu levels 50
Process display 51
Switching to the information level (Operator Menu) 51
Switching the operating mode 52
Start automatic adjustment 53
Switching to the configuration level (parameterization) 54
Selecting and changing parameters 54
Error messages on the LCD display 55
Overview of parameters on the configuration level 56
Parameter descriptions 60
Menu Easy Setup 60
Menu Device Setup 62
Menu: Display 68
Menu: Controller 69
Menu: Input/Output 72
Menu: Communication 78
Menu: Diagnosis 79
Menu: Device Info 81
Menu: Service 82

13 Diagnosis / error messages 84
Calling up the error description 84
Possible error messages 85

14 Maintenance 88

15 Repair 88
Returning devices 88

16 Recycling and disposal 88

17 Specification 88

18 Additional documents 88

19 Accessories 89
Extension modules 89
Accessories 89
Mounting material 89
Pressure gauge block 89
PC adapter for communication 89
Control program for operation and parameterization on a PC 89

20 Appendix 90
Return form 90
Control Drawing 901305 91

1 Safety

General information and instructions

These instructions are an important part of the product and must be retained for future reference.
Installation, commissioning, and maintenance of the product may only be performed by trained specialist personnel who have been authorized by the plant operator accordingly. The specialist personnel must have read and understood the manual and must comply with its instructions.
For additional information or if specific problems occur that are not discussed in these instructions, contact the manufacturer.
The content of these instructions is neither part of nor an amendment to any previous or existing agreement, promise or legal relationship.
Modifications and repairs to the product may only be performed if expressly permitted by these instructions.
Information and symbols on the product must be observed. These may not be removed and must be fully legible at all times.
The operating company must strictly observe the applicable national regulations relating to the installation, function testing, repair and maintenance of electrical products.

Warnings

The warnings in these instructions are structured as follows:

⚠ DANGER

The signal word '**DANGER**' indicates an imminent danger. Failure to observe this information will result in death or severe injury.

⚠ WARNING

The signal word '**WARNING**' indicates an imminent danger. Failure to observe this information may result in death or severe injury.

⚠ CAUTION

The signal word '**CAUTION**' indicates an imminent danger. Failure to observe this information may result in minor or moderate injury.

NOTICE

The signal word *'**NOTICE**'* indicates possible material damage.

Note
'**Note**' indicates useful or important information about the product.

Intended use

Positioning of pneumatically controlled actuators; designed for mounting on linear and rotary actuators.
The device is designed for use exclusively within the stated values on the name plate and in the data sheet.

- The maximum operating temperature must not be exceeded.
- The maximum ambient temperature must not be exceeded.
- The housing's rating must be observed during operation.

Improper use

The following are considered to be instances of especially improper use of the device:

- For use as a climbing aid, for example for mounting purposes.
- For use as a bracket for external loads, for example as a support for piping, etc.
- Material application, for example by painting over the housing, name plate or welding/soldering on parts.
- Material removal, for example by spot drilling the housing.

Warranty provisions

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using underqualified personnel, or making unauthorized alterations releases the manufacturer from liability for any resulting damage. This renders the manufacturer's warranty null and void.

Cyber security disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is operator's sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be).
Operator shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.
ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

On www.abb.com/cybersecurity under 'Additional resources', 'Alerts and notifications' you will find notifications about newly discovered software vulnerabilities. It is recommended that you visit this website regularly and activate 'Subscribe to email alerts' to receive email notifications about 'ABB cyber security alerts and notifications'.

Software downloads

By visiting the web page indicated below, you will find options to download the latest software. It is recommended that you visit this web page regularly:

ABB-Library – EDP300 – Software downloads

Manufacturer's address

ABB AG
Measurement & Analytics
Schillerstr. 72
32425 Minden
Germany
Tel: +49 571 830-0
Fax: +49 571 830-1806

Service address

Customer service center
Tel: +49 180 5 222 580
Email: automation.service@de.abb.com

2 Use in potentially explosive atmospheres in accordance with ATEX and IECEx

Product identification

Depending on the type of explosion protection, an Ex name plate is either attached or lasered next to the main name plate on the positioner.
This indicates the level of explosion protection and the device's relevant Ex certificate.
The meaning of the order code on the nameplate is described in the DS/EDP300 data sheet.

Ex marking

Note
Further information on the Ex-Approval of devices can be found in the type examination certificates or the relevant certificates at www.abb.com/positioners.

ATEX
Intrinsically safety for gas and dust atmosphere
FM21ATEX0020X
II 1G Ex ia IIC T6 Ga
II 1D Ex ia IIIC T_{200} 70°C Da
Ta = −40°C to 40°C
II 1G Ex ia IIC T4 Ga
II 1D Ex ia IIIC T_{200} 115°C Da
Ta = −40°C to 85°C
connection values: see manual
Increased safety and protection by housing
FM21ATEX0021X / FM21ATEX0020X
II 3G Ex ec IIC T6 Gc
II 2D Ex tb IIIC T_{200} 70°C Db
Ta = −40°C to 40°C
II 3G Ex ec IIC T4 Gc
Ta = −40°C to 80°C
II 2D Ex tb IIIC T_{200} 115°C Db
Ta = −40°C to 85°C
connection values: see manual

IECEx
Intrinsically safety for gas and dust atmosphere
IECEx FMG 21.0018X
Ex ia IIC T6 Ga
Ex ia IIIC T_{200} 70°C Da
Ta = −40°C to 40°C
Ex ia IIC T4 Ga
Ex ia IIIC T_{200} 115°C Da
Ta = −40°C to 85°C
connection values: see manual
Increased safety, non-sparking and protection by eclosure
IECEx FMG 21.0018X
Ex ec IIC T6 Gc; Ex nA IIC T6 Gc
Ex tb IIIC T_{200} 70°C Db
Ta = −40°C to 40°C
Ex ec IIC T4 Gc; Ex nA IIC T4 Gc
Ta = −40°C to 80°C
Ex tb IIIC T_{200} 115°C Db
Ta = −40°C to 85°C
connection values: see manual

Mounting

The installation, commissioning, maintenance and repair of devices in potentially explosive atmospheres must only be carried out by appropriately trained personnel. Works may be carried out only by persons, whose training has included instructions on different types of protection and installation techniques, concerned rules and regulations as well as general principles of zoning. The person must possess the appropriate competences for the type of work to be conducted.
When operating with combustible dusts, comply with EN 60079-31.
The safety instructions for electrical apparatus in potentially explosive areas must be in accordance with Directive 2014/34/EU (ATEX) and IEC 60079-14 (Installation of electrical equipment in potentially explosive areas).
Comply with the applicable regulations for the protection of employees to ensure safe operation.

⚠ DANGER

Explosion hazard due to hot components
There is a risk of explosion due to hot components danger of explosion.
- Never open the device immediately after switching it off.
- Before opening the device, wait at least five minutes before opening the device.

Note
Observe the device's applicable specifications and special conditions in accordance with the type examination certificate or other certificates!

- Any manipulation in the device by users is not permitted. Only the manufacturer or an explosion protection specialist may modify the device
- The device may only be operated using instrument air that is free from oil, water and dust.

Potential equalization

The positioner must be integrated into the local equipotential bonding system.
See **Potential equalization** on page 37.

Charging processes

High / recurring charging processes in gas areas must be excluded by the operator.

IP rating

The enclosure is tested up to IP 65 according to IEC 60529. The IP rating according IEC 60079-0 is IP 64.

Cable gland

- Limited temperature range of the M20 × 1.5 plastic cable gland for explosion protection variants:
  - The permissible ambient temperature range is −20 to 80 °C (−4 to 176 °F).
- When using the cable gland, make sure that the ambient temperature is within this range, plus 10 K or according to the minimum ambient temperature.
- The cable gland must be installed in the housing with a tightening torque of 3.8 Nm. When installing the connection of the cable gland and cable, check for tightness to ensure that the required IP rating is met.
- To ensure the required IP rating, NPT Cable glands have to be installed with approx. 1.5 layers of sealing tape or similar sealing, wrapped around the thread.

… 2 Use in potentially explosive atmospheres in accordance with ATEX and IECEx

… Mounting

Operation with flammable gases

Observe the following points when operating a device with flammable gases:

- The device must be used in accordance with the specifications in the relevant certificate.
- Only the design with the 'Intrinsic Safety' type of protection may be used for operation with natural gas. The pneumatic outputs must be vented in non-Ex areas.
- The maximum ambient temperature must not exceed 60 °C (140 °F).
- During operation with flammable gases in type of protection 'Ex n', the device may only be operated with approved cable glands.
- During operation with flammable gases, the cover cap for the air outlets can be removed, and the air outlets can be tubed separately. Both pipes must not be joined in one pipe.
- When operating with natural gas, the EDP300 must be fully loaded and vented several times during commissioning.

Operation in areas with combustible dust

Observe the following points when operating a device with combustible dust:

- To prevent loss of type of protection, the housing must not be opened.
- Only use cable glands which are approved for the type of protection and correspond to IP rating ≥ IP 6X.
- Danger due to propagating brush discharge must be avoided.

Operation in temperature class T6

During operation in temperature class T6, when the equipment is partially or fully depressurized, ensure that there is no possibility of a hazardous atmosphere getting into the pneumatic system or that any hazardous atmosphere is removed prior to compression by taking suitable action.

When commissioning in temperature class T6, flush the pneumatic system by applying 1.4 (±0.1) bar until all traces of any explosive mixture have been removed, yet for at least 5 minutes. Ventilate and evacuate the EDP300 fully several times.

ATEX and IECEx temperature data

Type of protection Ex i for gas atmosphere, intrinsic safety

Temperature class	Ambient temperature	Surface temperature
T4	−40 to 85 °C (−40 to 185 °F)	100 °C (212 °F)
T6	−40 to 40 °C (−40 to 104 °F)	55° C (131 °F)

Type of protection Ex i for dust atmosphere, intrinsic safety

Dust Layer thickness	Ambient temperature	Surface temperature
T_{200}	−40 to 85 °C (−40 to 185 °F)	115 °C (239 °F)
T_{200}	−40 to 40 °C (−40 to 104 °F)	70° C (158 °F)

Type of protection Ex ec – increased safety, Ex nA - non-sparking

Temperature class	Ambient temperature	Surface temperature
T4	−40 to 80 °C (−40 to 176 °F)	100 °C (212 °F)
T6	−40 to 40 °C (−40 to 104 °F)	55° C (131 °F)

Type of protection Ex tb – protection by enclosure

Dust Layer thickness	Ambient temperature	Surface temperature
T_{200}	−40 to 85 °C (−40 to 185 °F)	115 °C (239 °F)
T_{200}	−40 to 40 °C (−40 to 104 °F)	70° C (158 °F)

ATEX und IECEx electrical data

Type of protection Ex i, intrinsic safety

Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 1.1 W	P_i = 0.8 W
C_i = 6.5 nF without pressure option; 8.8 nF with pressure option	C_i = 6.5 nF without pressure option; 8.8 nF with pressure option
L_i = negligibly small	L_i = negligibly small

Digital input (DI)	
Terminals	+81 / −82
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Digital output (DO)	
Terminals	+83 / −84
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Option modules

Module for the emergency shutdown function
Terminals +85 / −86
Temperature class T1 – T6
-40°C <= Ta <= +85°C
U_i = 30 V
I_i = 320 mA
P_i = 1 W
C_i = 5.3 nF
L_i = negligibly small

Module for analog feedback (AO)	
Terminals	+31 / −32
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
U_i = 30 V	U_i = 28 V
I_i = 150 mA	I_i = 150 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for universal input (UAI)	
Terminals	+21 / −22
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
U_i = 30 V	U_i = 28 V
I_i = 150 mA	I_i = 150 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42 SW 2: +51 / −52
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
Per output:	Per output:
U_i = 30 V	U_i = 28 V
P_i = 0.5 W	P_i = 0.4 W
I_i = 150 mA	I_i = 150 mA
C_i = 2.2 nF per output	C_i = 2.2 nF per output
L_i = negligibly small	L_i = negligibly small

Limit switch (Limit 1 / Limit 2) **Limit monitor with proximity switches**	
Terminals	Limit 1: +51 / −52 Limit 2: +41 / −42
Temperature class T1 – T4	**Temperature class T6**
-40°C <= Ta <= +85°C	-40°C <= Ta <= +40°C
In accordance with type examination certificate PTB 00 ATEX 2049X	

… 2 Use in potentially explosive atmospheres in accordance with ATEX and IECEx

… ATEX und IECEx electrical data

Type of protection Ex n - non-sparking

Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Electrical values	$I_N \leq 22$ mA; $U_{max} \leq 30$ V

Digital input (DI)	
Terminals	+81 / −82
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Digital output (DO)	
Terminals	+83 / −84
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Option modules

Module for the emergency shutdown function	
Terminals	+85 / −86
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Module for analog feedback (AO)	
Terminals	+31 / −32
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Module for universal input (UAI)	
Terminals	+21 / −22
Electrical values	$I_N \leq 22$ mA; $U_{max} \leq 30$ V

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42 SW 2: +51 / −52
Electrical values	Per output: $I_N \leq 22$ mA; $U_N \leq 30$ V

Limit switch (Limit 1 / Limit 2) **Limit monitor with proximity switches**	
Terminals	Limit 1: +51 / −52 Limit 2: +41 / −42
Electrical values	Per output: $I_N \leq 25$ mA; $U_N \leq 16$ V

Specific Conditions of Use / Schedule of Limitations

For devices marked 'Ex ia'

1. The only Combustible /Explosive gas that can be used as a pneumatic medium with the EDP300 PositionMaster is Natural Gas.
2. Natural Gas is not allowed for use with the EDP300 marked as Ex nA, Ex ec or Ex tb.
3. The usage of the EDP300 PositionMaster with Natural Gas is only permitted in type of protection 'Intrinsically Safe' and shall be done according to Specific Conditions of Use # 5, and 6 listed below.
4. If the EDP300 PositionMaster is used according to Temperature Class T6, before the pressure supply is fully switched on, the pneumatic Unit shall be operated with a maximum pressure of 1.4 bar for so long until no more explosive mixture is present, but at least 5 minutes. During this operation, the EDP300 PositionMaster is to be fully loaded and vented.
5. If the EDP300 Position Master is used with Natural Gas gases, the venting of the PositionMaster has to be routed safely to outside the hazardous area.
6. If the EDP300 PositionMaster uses Natural Gas instead of compressed air, the maximum ambient Temperature is 60 °C (140 °F).
7. If the ordering option F3 is used the lower ambient temperature is reduced to −25 °C (−13 °F).
8. If the ordering option M1 is used, Limit Switches are not permitted.
9. For EPL Ga Applikation the aluminum enclosures of the EDP300 must be protected against an ignition hazard due to impact or friction. (do not apply to the Stainless Steel version)

For devices marked 'Ex ec' and 'Ex nA'

1. The specified operating voltage 30 V shall not be exceeded for the operation as category-3 equipment in types of protection 'Increased Safety ec' or 'Non-sparking device nA'. Furthermore, a transient overvoltage protection shall be provided. This shall be adjusted to a value of max. 140 % of the operating voltage 30 V at the supply terminals of the equipment.

Ambient temperature ranges as follows:

ATEX	IECEx	Ambient temperature range T_{amb}
II 1G Ex ia IIC T6 Ga	Ex ia IIC T6 Ga	−40 °C to 40 °C (−40 to 104 °F)
II 1D Ex ia IIIC T_{200} 70°C Da	Ex ia IIIC T_{200} 70°C Da	
II 3G Ex ec IIC T6 Gc	Ex ec IIC T6 Ga; Ex nA IIC T6 Gc	
II 2D Ex tb IIIC T_{200} 70°C Db	Ex tb IIIC T_{200} 70°C Da	
II 1G Ex ia IIC T4 Ga	Ex ia IIC T4 Ga	−40 °C to 85 °C (−40 to 185 °F)
II 1D Ex ia IIIC T_{200} 115°C Da	Ex ia IIIC T_{200} 115°C Da	
II 2D Ex tb IIIC T_{200} 115°C Db	Ex tb IIIC T_{200} 115°C Da	
II 3G Ex ec IIC T4 Gc	Ex ec IIC T4 Ga	−40 °C to 80 °C (−40 to 176 °F)
	Ex nA IIC T4 Gc	

… 2 Use in potentially explosive atmospheres in accordance with ATEX and IECEx

Commissioning

⚠ DANGER

Ensure Explosion protection compliance before operation
Before connecting or operating this device in a potentially explosive atmosphere, the operator must ensure the following:

Verify area classification and protection concept

- Confirm the hazardous area classification:
  - Zone 0, 1, 2 (gas) or Zone 20, 21, 22 (dust)
  - Ensure the device's marking and type of protection (e.g., Ex ia, Ex ec) match the installation requirements.

Intrinsic safety requirements

- If the device is intended for intrinsically safe (Ex i) operation, it must be powered only by an approved intrinsically safe power source. Using a non-intrinsically safe supply can permanently compromise safety and invalidate certification.

Avoid mixed atmospheres

Even if the device is certified for both gas and dust, do not allow simultaneous presence of gas and dust or mixtures, unless explicitly stated in the certification. This is prohibited under IEC 60079 due to increased ignition risk.

3 Use in potentially explosive atmospheres in accordance with cFMus

Product identification

Depending on the type of explosion protection, an Ex name plate is either attached or lasered next to the main name plate on the positioner.
This indicates the level of explosion protection and the device's relevant Ex certificate.
The meaning of the order code on the nameplate is described in the DS/EDP300 data sheet.

The device has received FM Approval and has been evaluated by FM Approvals according to Canadian and U.S. codes and standards.

Ex marking

cFMus	
FM Approval	FM25US0289X, FM25CA0097X
Control drawing	901305
NI Cl I, II, III, Div. 2, Gp. ABCDEFG T4/T6	
Cl I, Zone 2, AEx/Ex nA IIC T4/T6 Gc	
Cl I, Zone 2, AEx/Ex ec IIC T4/T6 Gc	
DIP Cl II, III, Div. 1, Gp. EFG T4/T6	
Zone 21, AEx tb IIIC T70°C/T115°C Db	
IS Cl I, II, III, Div. 1, Gp. ABCDEFG T4/T6	
Cl I, Zone 0, AEx/Ex ia IIC T4/T6 Ga	
Zone 20, AEx/Ex ia IIIC T70°C/T115°C Da	
Ta: see certificate	
Type 4X, IP64	

Note
Further information on the Ex-Approval of devices can be found in the type examination certificates or the relevant certificates at www.abb.com/positioners.

Mounting

The installation, commissioning, maintenance and repair of devices in areas with explosion hazard must only be carried out by appropriately trained personnel.
The operator must strictly observe the applicable national regulations with regard to installation, function tests, repairs, and maintenance of electrical devices. (e. g. NEC, CEC).

⚠ DANGER

Explosion hazard due to hot components
There is a risk of explosion due to hot components danger of explosion.
- Never open the device immediately after switching it off.
- Before opening the device, wait at least five minutes before opening the device.

Note
Observe the device's applicable specifications and special conditions in accordance with the relevant certificate.

- Any manipulation in the device by users is not permitted. Only the manufacturer or an explosion protection specialist may modify the device
- The device may only be operated using instrument air that is free from oil, water and dust.

… 3 Use in potentially explosive atmospheres in accordance with cFMus

… Mounting

Potential equalization

The positioner must be integrated into the local equipotential bonding system.
See **Potential equalization** on page 37.

Charging processes

High / recurring charging processes in gas areas must be excluded by the operator.

Cable gland

- Limited temperature range of the M20 × 1.5 plastic cable gland for explosion protection variants:
  - The permissible ambient temperature range is −20 to 80 °C (−4 to 176 °F).
- When using the cable gland, make sure that the ambient temperature is within this range, plus 10 K or according to the minimum ambient temperature.
- The cable gland must be installed in the housing with a tightening torque of 3.8 Nm. When installing the connection of the cable gland and cable, check for tightness to ensure that the required IP rating is met.
- To ensure the required IP rating, NPT Cable glands have to be installed with approx. 1.5 layers of sealing tape or similar sealing, wrapped around the thread.

Operation with flammable gases

Observe the following points when operating a device with flammable gases:

- The device must be used in accordance with the specifications in the relevant certificate.
- The usage of the EDP300 PositionMaster with Natural Gas is only permitted in type of protection 'Intrinsically Safe' and shall be done according to the **Specific Conditions of Use** on page 15.
- During operation with flammable gases, the cover cap for the air outlets must be removed and the air outlets tubed separately. Both pipes must not be joined in one pipe.
- The maximum ambient temperature must not exceed 60 °C (140 °F).
- When operating with natural gas, the EDP300 must be fully loaded and vented several times during commissioning.

Operation in areas with combustible dust

Observe the following points when operating a device with combustible dust:

- To prevent loss of type of protection, the housing must not be opened.
- Only use cable glands which are approved for the type of protection and correspond to IP rating ≥ IP6X.
- Danger due to propagating brush discharge must be avoided.

Operation in temperature class T6

During operation in temperature class T6, when the equipment is partially or fully depressurized, ensure that there is no possibility of an explosive atmosphere getting into the pneumatic system or that any explosive atmosphere is removed prior to compression by taking suitable action.

When commissioning in temperature class T6, flush the pneumatic system by applying 1.4 (±0.1) bar until all traces of any explosive mixture have been removed, yet for at least 5 minutes. Ventilate and evacuate the EDP300 fully several times.

Specific Conditions of Use

For product marked Zone 20/Zone 21, AEx ia IIIC Ga or Gb and Zone 21, AEx tb IIIC Gb

1 The only Combustible/Explosive gas that can be used as a pneumatic medium with the PositionMaster EDP300 is Natural Gas.
2 Natural Gas is not allowed for use with the EDP300 marked as or Ex 'tb'.
3 The usage of the PositionMaster EDP300 with Natural Gas is only permitted in type of protection 'Intrinsically Safe' and shall be done according to **Specific Conditions of Use** #5 and #6 listed below.
4 If the PositionMaster EDP300 is used according to Temperature Class T6, before the pressure supply is fully switched on; the pneumatic Unit shall be operated with a maximum pressure of 1.4 bar (20.3 psi) for so long until no more explosive mixture is present, but at least 5 min. During this operation, the PositionMaster EDP300 is to be fully loaded and vented several times.
5 If the PositionMaster EDP300 is used with Natural Gas gases, the venting of the PositionMaster has to be routed safely to outside the hazardous area.
6 If the PositionMaster EDP300 uses Natural Gas instead of compressed air, the maximum ambient temperature is 60 °C (140 °F).
7 For EPL Ga Application the aluminium enclosures of the EDP300 must be protected against an ignition hazard due to impact or friction. (does not apply to the stainless-steel version).
8 For AEX ia Certification only when a mechanical position sensor is used within the Remote Sensor option, The use of this assembly is limited to Class I, Zone 1, AEX ia IIC Gb or Zone 21, AEX ia IIIC Db.

For product marked Intrinsically Safe Class I, II, III Division I, Groups A, B, C, D, E, F and G

1 The only Combustible/Explosive gas that can be used as a pneumatic medium with the PositionMaster EDP300 is Natural Gas as outlined in **Control Drawing 901305** on page 91.

For product marked Class I, Zone 2, AEx ec and Class I, Zone 2, AEx nA

1 Natural Gas is not allowed for use with the EDP300 marked as Ex nA, or Ex ec.
2 The specified operating voltage 30 V shall not be exceeded for the operation as category-3 equipment in types of protection "Increased Safety ec" or "Non-sparking device nA". Furthermore, a transient overvoltage protection shall be provided. This shall be adjusted to a value of no more than 140 % of the operating voltage 30 V at the supply terminals of the equipment.

… 3 Use in potentially explosive atmospheres in accordance with cFMus

Temperature data

Note

Legibility of the display is guaranteed at an ambient temperature of −20 to 70 °C (−4 to 158 °F). At 20 °C (68 °F) and lower, legibility can become limited. Legibility can be compensated by adjusting contrast. Contrast adjustment can be made manually directly on the device.

The display can fail at temperatures below −20 °C (−4 °F). Moreover, functioning of the device is guaranteed up to −40 °C (−40 °F).

cFMus

Equipment protection	Temperature class	Ambient temperature T_{amb}
Non-Incendive	T1 to T4	−40 °C to 80 °C
AEx / Ex nA, AEx / Ex ec	T6	−40 °C to 40 °C
Dust-Ignitionproof	T1 to T4	−40 °C to 85 °C
	T6	−40 °C to 40 °C
Intrinsic Safety	T1 to T4	−40 °C to 85 °C*
AEx / Ex ia (Gas)	T6	−40 °C to 40 °C
AEx / Ex ia (Dust)	T_{200} 115°C	−40 °C to 85 °C*
	T_{200} 70°C	−40 °C to 40 °C
AEx / Ex tb	T_{200} 115°C	−40 °C to 85 °C
	T_{200} 70°C	−40 °C to 40 °C

* 60 °C maximum with natural gas

Electrical data

Intrinsic Safety and NIFW connection values

Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 1.1 W	P_i = 0.8 W
C_i = 6.5 nF without pressure option; 8.8 nF with pressure option	C_i = 6.5 nF without pressure option; 8.8 nF with pressure option
L_i = negligibly small	L_i = negligibly small

Digital input (DI)	
Terminals	+81 / −82
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Digital output (DO)	
Terminals	+83 / −84
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Option modules

Module for the emergency shutdown function	
Terminals	+85 / −86
Temperature class T1 – T6	
U_i = 30 V	
P_i = 1 W	
C_i = 5.3 nF	
L_i = negligibly small	

Module for analog feedback (AO)	
Terminals	+31 / −32
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 150 mA	I_i = 150 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for universal input (UAI)	
Terminals	+21 / −22
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 150 mA	I_i = 150 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42
	SW 2: +51 / −52
Temperature class T1 – T4	**Temperature class T6**
Per output:	Per output:
U_i = 30 V	U_i = 28 V
P_i = 0.5 W	P_i = 0.4 W
I_i = 150 mA	I_i = 150 mA
C_i = 2.2 nF per output	C_i = 2.2 nF per output
L_i = negligibly small	L_i = negligibly small

Limit switch (Limit 1 / Limit 2)	
Limit monitor with proximity switches	
Terminals	Limit 1: +51 / −52
	Limit 2: +41 / −42
Temperature class T1 – T4	**Temperature class T6**
cULus Listed, see Control Drawing No. 116-0454	

For DIP marking

Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA
Digital input (DI)	
Terminals	+81 / −82
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA
Digital output (DO)	
Terminals	+83 / −84
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA

Option modules

Module for the emergency shutdown function	
Terminals	+85 / −86
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA

Module for analog feedback (AO)	
Terminals	+31 / −32
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA

Module for universal input (UAI)	
Terminals	+21 / −22
Electrical values	U_{max} ≤ 30 V; I_N ≤ 22 mA

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42
	SW 2: +51 / −52
Electrical values	Per output: U_{max} ≤ 30 V; I_N ≤ 22 mA

Limit switch (Limit 1 / Limit 2)	
Limit monitor with proximity switches	
Terminals	Limit 1: +51 / −52
	Limit 2: +41 / −42
Electrical values	Per output: U_{max} ≤ 26 V; I_N ≤ 25 mA

… 3 Use in potentially explosive atmospheres in accordance with cFMus

Commissioning

⚠ DANGER

Ensure Explosion protection compliance before operation
Before connecting or operating this device in a potentially explosive atmosphere, the operator must ensure the following:

Verify area classification and protection concept

- Confirm the hazardous area classification:
  - Zone 0, 1, 2 (gas) or Zone 20, 21, 22 (dust)
  - Class I, II, III; Division 1 or 2
  - Ensure the device's marking and type of protection (e.g., Ex ia, Ex ec, IS, NI) match the installation requirements.

Intrinsic safety and non-incendive requirements

- If the device is intended for intrinsically safe (IS, Ex i) operation, it must be powered only by an approved intrinsically safe power source. Using a non-intrinsically safe supply can permanently compromise safety and invalidate certification.
- For non-incendive (NI) circuits (NEC Division 2), ensure compliance with voltage/current limits and that no arcs or sparks occur under normal operation.

Avoid mixed atmospheres

Even if the device is certified for both gas and dust, do not allow simultaneous presence of gas and dust or mixtures, unless explicitly stated in the certification. This is prohibited under IEC 60079 and NEC 500 due to increased ignition risk.

4 Use in hazardous areas in accordance with EAC TR-CU-012

Product identification

Depending on the type of explosion protection, an Ex name plate is either attached or lasered next to the main name plate on the positioner.
This indicates the level of explosion protection and the device's relevant Ex certificate.
The meaning of the order code on the nameplate is described in the DS/EDP300 data sheet.

Ex marking

EAC TR-CU-012	
Certificate	EAC TR-CU-012
0Ex ia IIC T6/T4 Ga X	
Ex ia IIIC T55°C/T100°C Da X	
2Ex nA II T6/T4 Gc X	
Ex tb IIIC T55°C/T100°C Db X	

Note
Further information on the Ex-Approval of devices can be found in the type examination certificates or the relevant certificates at www.abb.com/positioners.

Mounting

The installation, commissioning, maintenance and repair of devices in potentially explosive atmospheres must only be carried out by appropriately trained personnel. Works may be carried out only by persons, whose training has included instructions on different types of protection and installation techniques, concerned rules and regulations as well as general principles of zoning. The person must possess the appropriate competences for the type of work to be conducted.
When operating with combustible dusts, comply with EN 60079-31.
The safety instructions for electrical apparatus in potentially explosive areas must be in accordance with Directive 2014/34/EU (ATEX) and IEC 60079-14 (Installation of electrical equipment in potentially explosive areas).
Comply with the applicable regulations for the protection of employees to ensure safe operation.

Note
Observe the device's applicable specifications and special conditions in accordance with the type examination certificate or other certificates!

- Any manipulation in the device by users is not permitted. Only the manufacturer or an explosion protection specialist may modify the device
- The device may only be operated using instrument air that is free from oil, water and dust.

Cable gland

- Limited temperature range of the M20 × 1.5 plastic cable gland for explosion protection variants:
  - The permissible ambient temperature range is −20 to 80 °C (−4 to 176 °F).
- When using the cable gland, make sure that the ambient temperature is within this range, plus 10 K or according to the minimum ambient temperature.
- The cable gland must be installed in the housing with a tightening torque of 3.8 Nm. When installing the connection of the cable gland and cable, check for tightness to ensure that the required IP rating is met.
- To ensure the required IP rating, NPT Cable glands have to be installed with approx. 1.5 layers of sealing tape or similar sealing, wrapped around the thread.

… 4 Use in hazardous areas in accordance with EAC TR-CU-012

… Mounting

Operation with flammable gases

Observe the following points when operating a device with flammable gases:

- The device must be used in accordance with the specifications in the relevant certificate.
- Only the design with the 'Intrinsic Safety' type of protection may be used for operation with natural gas. The pneumatic outputs must be vented in non-Ex areas.
- The maximum ambient temperature must not exceed 60 °C (140 °F).
- During operation with flammable gases in type of protection 'Ex n', the device may only be operated with approved cable glands.
- During operation with flammable gases, the cover cap for the air outlets can be removed, and the air outlets can be tubed separately. Both pipes must not be joined in one pipe.
- When operating with natural gas, the EDP300 must be fully loaded and vented several times during commissioning.

Operation in areas with combustible dust

Observe the following points when operating a device with combustible dust:

- To prevent loss of type of protection, the housing must not be opened.
- Only use cable glands which are approved for the type of protection and correspond to IP rating ≥ IP 6X.
- Danger due to propagating brush discharge must be avoided.

Operation in temperature class T6

During operation in temperature class T6, when the equipment is partially or fully depressurized, ensure that there is no possibility of a hazardous atmosphere getting into the pneumatic system or that any hazardous atmosphere is removed prior to compression by taking suitable action.

When commissioning in temperature class T6, flush the pneumatic system by applying 1.4 (±0.1) bar until all traces of any explosive mixture have been removed, yet for at least 5 minutes. Ventilate and evacuate the EDP300 fully several times.

Temperature data

Type of protection Ex i, intrinsic safety

Temperature class	Ambient temperature	Surface temperature
T4	−40 to 85 °C (−40 to 185 °F)	100 °C (212 °F)
T6	−40 to 40 °C (−40 to 104 °F)	55° C (131 °F)

Type of protection Ex n - non-sparking

Temperature class	Ambient temperature	Surface temperature
T4	−40 to 80 °C (−40 to 176 °F)	100 °C (212 °F)
T6	−40 to 40 °C (−40 to 104 °F)	55° C (131 °F)

Electrical data EAC TR-CU-012

Type of protection Ex i, intrinsic safety

Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 1.1 W	P_i = 0.8 W
C_i = 6.5 nF without pressure option; 8.8 nF with pressure option	C_i = 6.5 nF without pressure option; 8.8 nF with pressure option
L_i = negligibly small	L_i = negligibly small

Temperature characteristic curves

Intrinsically safe circuit according to ATEX, IECEx and EAC / TR CU 012/2011
Device category 1: Use in Zone 0
Device category 2: Use in Zone 1
Device category 3: Use in Zone 2

Digital input (DI)	
Terminals	+81 / −82
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Digital output (DO)	
Terminals	+83 / −84
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 500 mW	P_i = 400 mW
C_i = 4.2 nF	C_i = 4.2 nF
L_i = negligibly small	L_i = negligibly small

Option modules

Module for the emergency shutdown function	
Terminals	+85 / −86
Temperature class T1 – T6	
U_i = 30 V	
P_i = 1 W	
C_i = 5.3 nF	
L_i = negligibly small	

Module for analog feedback (AO)	
Terminals	+31 / −32
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for universal input (UAI)	
Terminals	+21 / −22
Temperature class T1 – T4	**Temperature class T6**
U_i = 30 V	U_i = 28 V
I_i = 320 mA	I_i = 320 mA
P_i = 1 W	P_i = 0.8 W
C_i = 11.3 nF	C_i = 11.3 nF
L_i = 150 µH	L_i = 150 µH

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42 SW 2: +51 / −52
Temperature class T1 – T4	**Temperature class T6**
Per output:	Per output:
U_i = 30 V	U_i = 28 V
P_i = 0.5 W	P_i = 0.4 W
I_i = 150 mA	I_i = 150 mA
C_i = 2.2 nF per output	C_i = 2.2 nF per output
L_i = negligibly small	L_i = negligibly small

Limit switch (Limit 1 / Limit 2) **Limit monitor with proximity switches**	
Terminals	Limit 1: +51 / −52 Limit 2: +41 / −42
Temperature class T1 – T4	**Temperature class T6**
In accordance with type examination certificate PTB 00 ATEX 2049X	

* No IECEx approval

… 4 Use in hazardous areas in accordance with EAC TR-CU-012

… Electrical data EAC TR-CU-012

Type of protection Ex n - non-sparking
Basic device

Signal circuit (AI)	
Terminals	+11 / −12
Electrical values	$I_N \leq 22$ mA; $U_{max} \leq 30$ V

Digital input (DI)	
Terminals	+81 / −82
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Digital output (DO)	
Terminals	+83 / −84
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Option modules

Module for the emergency shutdown function	
Terminals	+85 / −86
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Module for analog feedback (AO)	
Terminals	+31 / −32
Electrical values	$I_N \leq 22$ mA; $U_N \leq 30$ V

Module for universal input (UAI)	
Terminals	+21 / −22
Electrical values	$I_N \leq 22$ mA; $U_{max} \leq 30$ V

Module for digital feedback (SW1 / SW2)	
Terminals	SW 1: +41 / −42 SW 2: +51 / −52
Electrical values	Per output: $I_N \leq 22$ mA; $U_N \leq 30$ V

Limit switch (Limit 1 / Limit 2) **Limit monitor with proximity switches**	
Terminals	Limit 1: +51 / −52 Limit 2: +41 / −42
Electrical values	Per output: $I_N \leq 25$ mA; $U_N \leq 16$ V

Commissioning

⚠ DANGER

Ensure Explosion protection compliance before operation
Before connecting or operating this device in a potentially explosive atmosphere, the operator must ensure the following:

Verify area classification and protection concept

- Confirm the hazardous area classification:
  - Zone 0, 1, 2 (gas) or Zone 20, 21, 22 (dust)
  - Ensure the device's marking and type of protection (e.g., Ex ia, Ex ec) match the installation requirements.

Intrinsic safety requirements

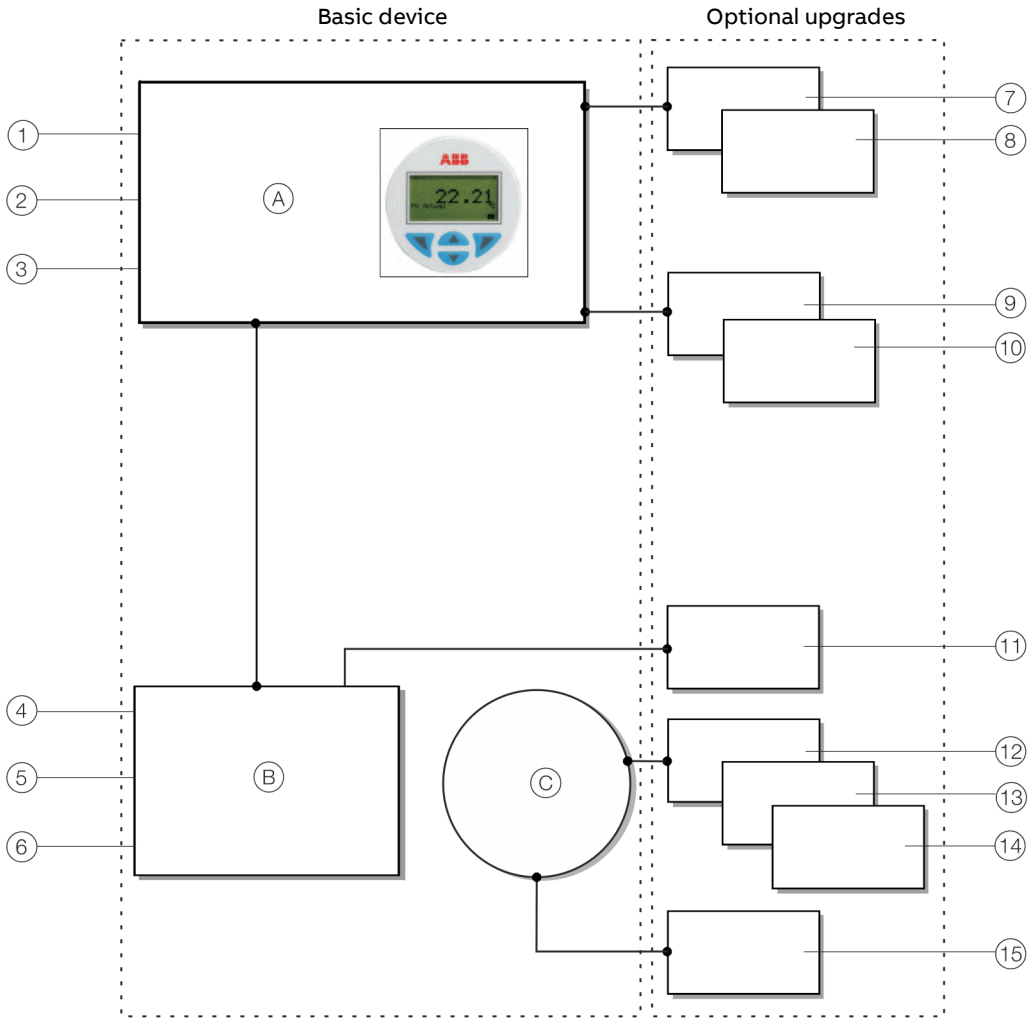
- If the device is intended for intrinsically safe (Ex i) operation, it must be powered only by an approved intrinsically safe power source. Using a non-intrinsically safe supply can permanently compromise safety and invalidate certification.

Avoid mixed atmospheres

Even if the device is certified for both gas and dust, do not allow simultaneous presence of gas and dust or mixtures, unless explicitly stated in the certification. This is prohibited under IEC 60079 due to increased ignition risk.

5 Design and function

Schematic diagram



(A) Electronics
(B) Pneumatics
(C) Position sensor
(1) 4 to 20 mA / Bus connection
(2) Digital input
(3) Alarm output
(4) Supply air
(5) Output 1
(6) Output 2
(7) Analog feedback
(8) Digital feedback
(9) Emergency shutdown module
(10) Universal input
(11) Pressure sensor
(12) Limit alarm with 24 V microswitch
(13) Limit alarm with proximity switch (NC)
(14) Limit alarm with proximity switch (NO)
(15) Visual position indication

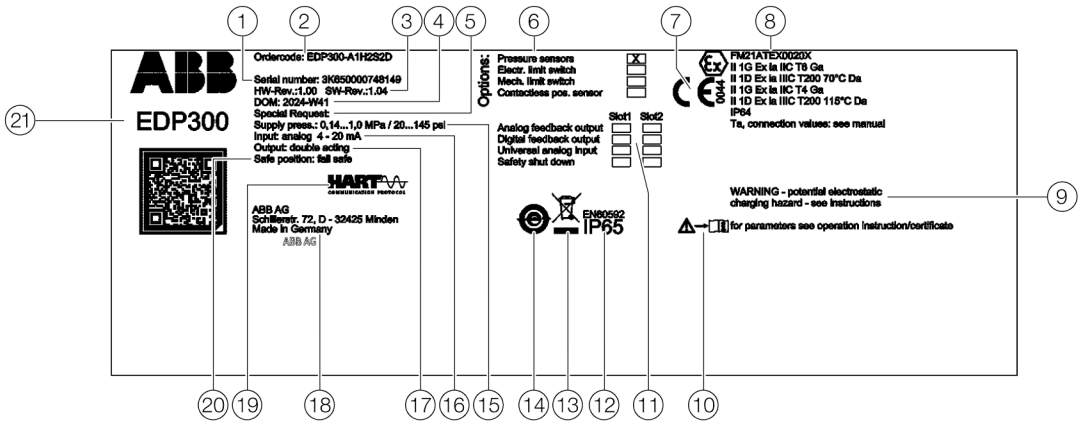
Figure 1: Schematic diagram of the positioner

Principle of operation

The PositionMaster EDP300 is an electronically configurable positioner with communication capabilities designed for mounting on pneumatic linear or rotary actuators.
Fully automatic determination of the control parameters and adaptation to the positioner allow for considerable time savings as well as optimum control behavior.

6 Product identification

Name plate



1. Serial number
2. Order code
3. Hardware rev. / software rev.
4. Year of manufacture / calendar week
5. Special request
6. Additional options
7. CE mark
8. Explosion protection marking (Example: ATEX)
9. WARNING – potential electrostatic charging hazard - see instructions
10. Notice: Observe product documentation
11. Installed option modules
12. IP rating
13. Disposal information
14. China RoHS marking
15. Supply air pressure
16. Input signal
17. Pneumatic system mode of action
18. Manufacturer address
19. Communications protocol
20. Reaction in case of power failure
21. Type designation

Figure 2: Name plate (example)

Note

The name plates displayed are examples. The device identification plates affixed to the device can differ from this representation.

7 Transport and storage

Inspection

Check the devices immediately after unpacking for possible damage that may have occurred from improper transport. Details of any damage that has occurred in transit must be recorded on the transport documents.
All claims for damages must be submitted to the shipper without delay and before installation.

Transporting the device

Observe the following instructions:

- Do not expose the device to humidity during transport. Pack the device accordingly.
- Pack the device so that it is protected against vibrations during transport, for example, by using air-cushioned packing.

Storing the device

- The device must be stored in dry and dust-free conditions.
- Observe the permissible storage and transportation temperatures.
- Protect uncovered metallic surfaces with a suited long-term corrosion inhibitor.
- Observe the relevant long-term storage temperatures.
- In principle, the devices may be stored for an unlimited period. However, the warranty conditions stipulated in the order confirmation of the supplier apply.

Ambient conditions

Transport and storage	
Ambient temperature range	−40 to 85 °C (−40 to 185 °F)
Relative humidity	75% annual average

Returning devices

For the return of devices, follow the instructions in **Repair** on page 88.

8 Installation

Safety instructions

⚠ CAUTION

Risk of injury due to incorrect parameter values!
Incorrect parameter values can cause the valve to move unexpectedly. This can lead to process failures and result in injuries.

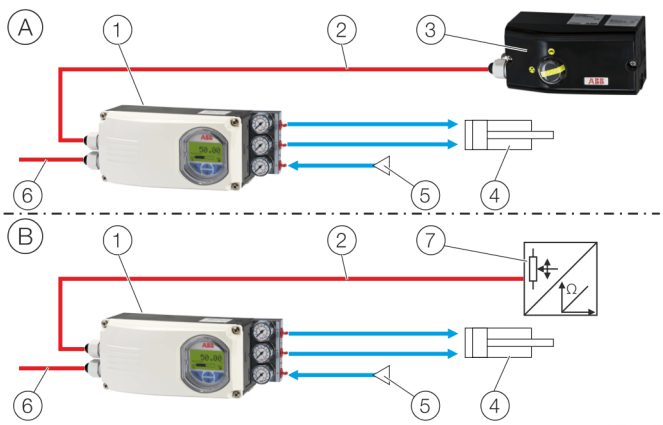
- Before recommissioning a positioner that was previously in use at another location, always reset the device to its factory settings.
- Never start automatic adjustment before restoring the factory settings!

Note
Before assembly, check whether the positioner meets the control and safety requirements for the installation location (actuator or final control element).
Refer to the **Specification** in the data sheet.

Only qualified specialists who have been trained for these tasks are authorized to mount and adjust the unit, and to make the electrical connection.
When carrying out any work on the device, always observe the local accident prevention regulations and the regulations concerning the construction of technical installations.

… 8 Installation

External position sensors



1 EDP300 Control Unit
2 Connection cable
3 EDP300 Remote Sensor
4 Actuator
5 Compressed air supply
6 Set point signal
7 Remote position sensor

Figure 3: EDP300 with external position sensors

Note
If the device is being operated on a cylinder, for reasons associated with linearity you should run the Auto Adjust function for rotary actuators (see **Start automatic adjustment** on page 53).

Ⓐ EDP300 control unit with EDP300 remote sensor
In this version, the components are supplied in two housings, which together form one harmonized unit.
The following points should be observed during installation:

- Housing 1 (EDP300 Control Unit) contains the electronics and pneumatics and is mounted separately from the actuator.
- Housing 2 (EDP300 Remote Sensor) contains the position sensor and is mounted on the linear and rotary actuator. Mechanical mounting is described in **Mechanical mounting** on page 27.
- Electrical connection is carried out as described in **Connection to device – EDP300 Control Unit with EDP300 Remote Sensor** on page 43.

Note
To connect the EDP300 Remote Sensor, a cable with the following specifications needs to be used:

- 3-wire, cross-section 0.5 to 1.0 mm²
- shielded, with at least 85 % coverage
- Temperature range up to at least 100 °C (212 °F)

The cable glands must also be approved for a temperature range up to at least 100 °C (212 °F). The cable glands require a mounting for the shielding and strain relief for the cable in addition.
ABB optionally offers a cable gland and cable for the EDP300 Remote Version.

Ⓑ EDP300 Control Unit for remote position sensor
In this version the positioner is supplied without a position sensor.
The following points should be observed during installation:

- Housing 1 (EDP300 Control Unit) contains the electronics and pneumatics and is mounted separately from the actuator.
- The remote position sensor is mounted on the linear actuator or rotary actuator. Follow the operating instructions for the remote position sensor for mechanical mounting!
- Electrical connection is carried out as described in **Connection on device – EDP300 Control Unit for remote position sensor** on page 45.

Mechanical mounting

General

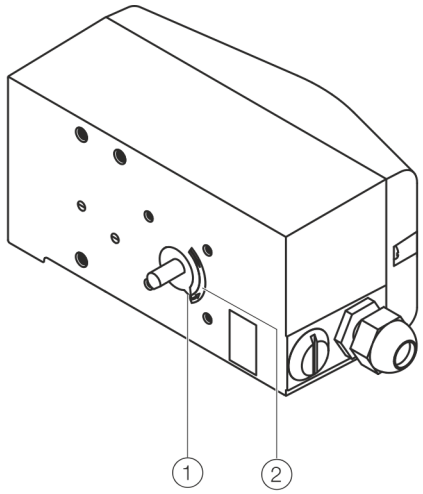
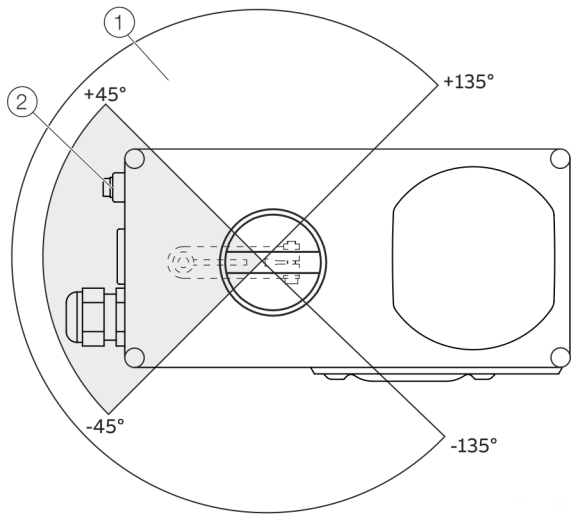


Figure 4: Operating range

Arrow ① on the device feedback shaft (position feedback point) must move between the arrow marks ②.



① Measuring range ② Operating range

Figure 5: Measuring and operating ranges of the positioner

Operating range for linear actuators:
The operating range for linear actuators is ±45° symmetrically to the longitudinal axis. The usable span within the operating range is at least 25° (recommended figure 40°). The usable span does not necessarily need to run symmetrically to the longitudinal axis.

Operating range of rotary actuators:
The usable span is 90°, which must be entirely within the measuring range, but does not necessarily need to run symmetrically to the longitudinal axis.

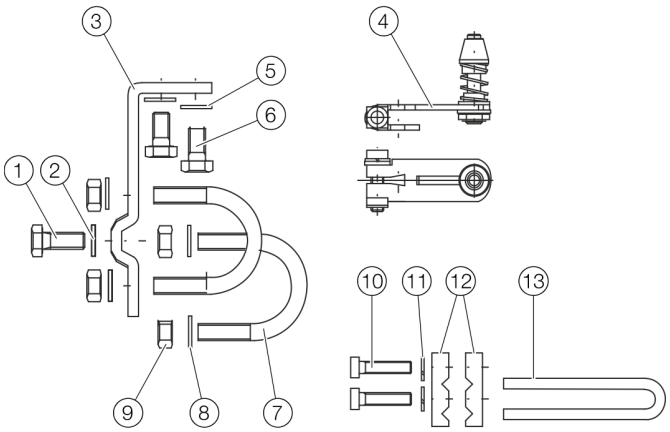
Note
During installation make sure that the actuator travel or rotation angle for position feedback is implemented correctly.

… 8 Installation

… Mechanical mounting

Mounting on linear actuators

For mounting on a linear actuator in accordance with DIN / IEC 534 (lateral mounting as per NAMUR), the following attachment kit is available:



1	Screw	7	U-bolts
2	Washer	8	Washers
3	Mounting bracket	9	Nuts
4	Lever with follower pin for mechanical stroke 10 to 35 mm (0.39 to 1.38 in) or 20 to 100 mm (0.79 to 3.94 in)	10	Screws
		11	Spring washers
		12	Clamp plates
5	Washers	13	Follower guide
6	Screws		

Figure 6: Components of attachment kit

Required tools

- Wrench, size 8 / 10
- Allen key, size 3

Tightening torque for screws

Tighten the screws and nuts to a tightening torque of 7 Nm (±0.5 Nm) during assembly.

Installing the mounting kit

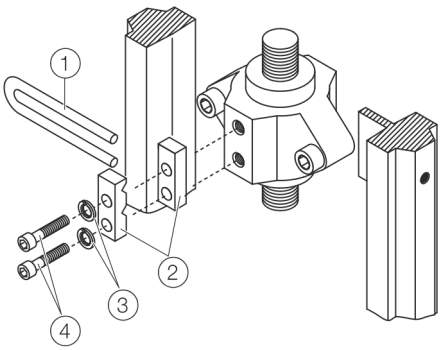


Figure 7: Attaching a follower guide to the actuator

1. Tighten the screws to the specified torque (see section **Tightening torque for screws**).
2. Attach the follower guide (1) and clamp plates (2) with screws (4) and spring washers (3) to the actuator stem.

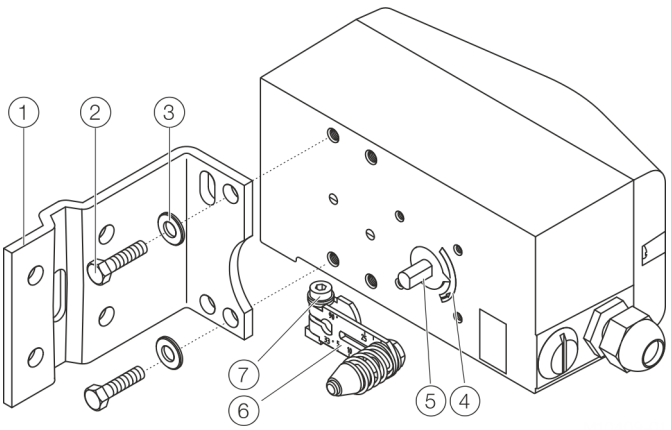


Figure 8: Mounting lever and bracket on the positioner

1. Attach the lever (6) to the feedback shaft (5) of the positioner (can only be mounted in one position due to the cut shape of the feedback shaft).
2. Using the arrow marks (4), check whether the lever moves within the operating range (between the arrows).
3. Hand-tighten the screw (7) on the lever.
4. Hold the prepared positioner (with the mount bracket (1) still loose) on the actuator so that the follower pin for the lever enters the follower guide to determine which tap holes on the positioner must be used for the mount bracket.
5. Secure the mount bracket (1) with screws (2) and washers (3) using the relevant tap holes on the positioner housing. Tighten the screws as evenly as possible to ensure subsequent linearity. Align the mount bracket in the oblong hole to ensure that the operating range is symmetrical (lever moves between the arrow marks (4)).

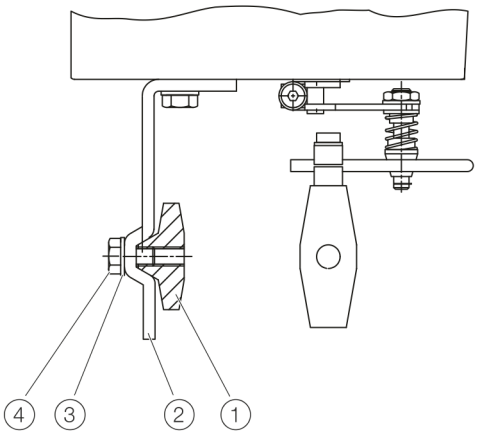


Figure 9: Mounting on a cast iron yoke

1. Attach the mount bracket ② with screw ④ and washer ③ to the cast iron yoke ①.

or

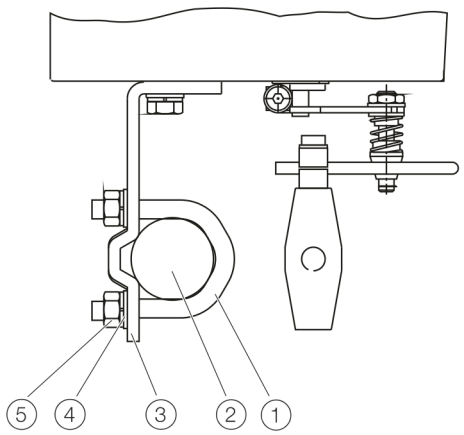


Figure 10: Mounting on a columnar yoke

1. Hold the mount bracket ③ in the proper position on the columnar yoke ②.
2. Insert the U-bolts ① from the inside of the columnar yoke ② through the holes of the mount bracket.
3. Add the washers ④ and nuts ⑤.
4. Tighten the nuts to the specified torque (see section **Tightening torque for screws**)

Note
Adjust the height of the positioner on the cast iron yoke or columnar yoke until the lever is horizontal (based on a visual check) at half stroke of the valve.

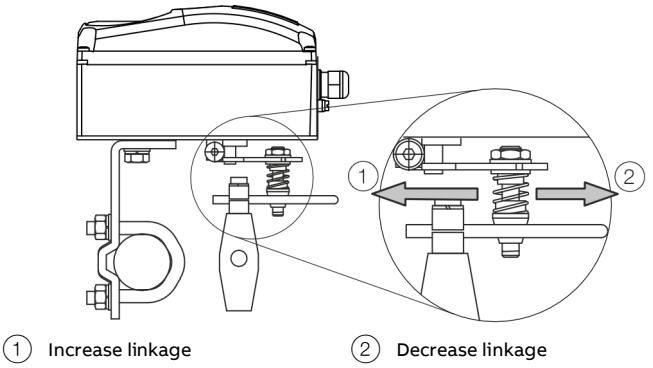


Figure 11: Positioner linkage

The scale on the lever indicates the link points for the various stroke ranges of the valve.
Move the bolt with the follower pin in the oblong hole of the lever to adjust the stroke range of the valve to the working range for the position sensor.
Moving the link point inwards increases the rotation angle of the position sensor. Moving the link point outwards reduces the rotation angle of the position sensor.
Adjust the actuator stroke to make use of as large an angle of rotation as possible (symmetrical around the center position) on the position sensor.

Recommended range for linear actuators:
−30° to 30°; minimum range: 25°

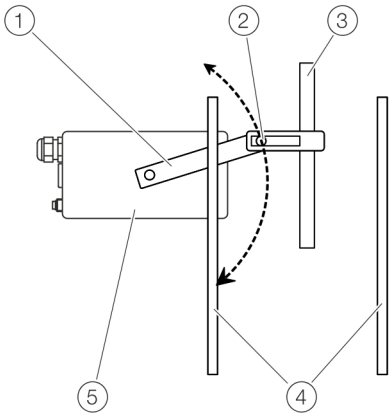
Note
After mounting, check whether the positioner is operating within the sensor range, see **Mechanical mounting** on page 27.

… 8 Installation

… Mechanical mounting

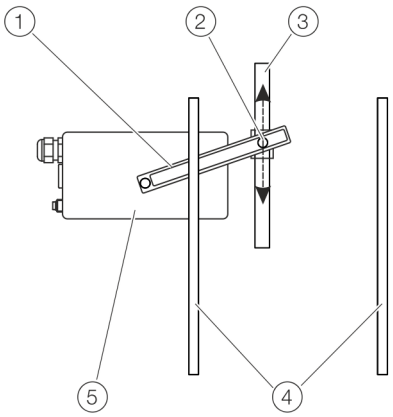
Position of actuator bolt

The actuator bolt for moving the potentiometer lever can be mounted permanently on the lever itself or on the valve stem. Depending on the mounting method, when the valve moves the actuator bolt performs either a circular or a linear movement with reference to the center of rotation of the potentiometer lever. Select the chosen bolt position in the HMI menu in order to ensure optimum linearization. The default setting is as follows:



1 Potentiometer lever
2 Actuator bolts
3 Valve stem
4 Valve yoke
5 Positioner

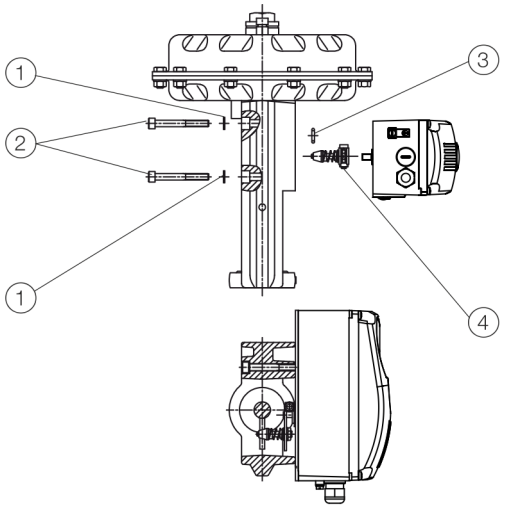
Figure 12: Actuator bolts on the lever (rear view)



1 Potentiometer lever
2 Actuator bolts
3 Valve stem
4 Valve yoke
5 Positioner

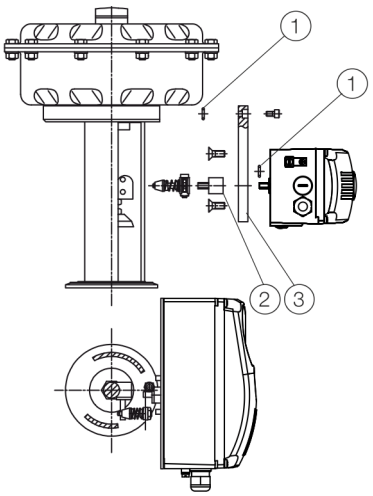
Figure 13: Actuator bolts on the valve (rear view)

Mounting on control valves



1 Washers
2 Screws
3 O-ring
4 Lever

Figure 14: Integral mounting on control valves



1 O-ring
2 Adapter plate
3 Adapter

Figure 15: Integral mounting on control valves with adapter plate

Mounting on rotary actuator

For mounting on part-turn actuators in accordance with VDI / VDE 3845, the following attachment kit is available:

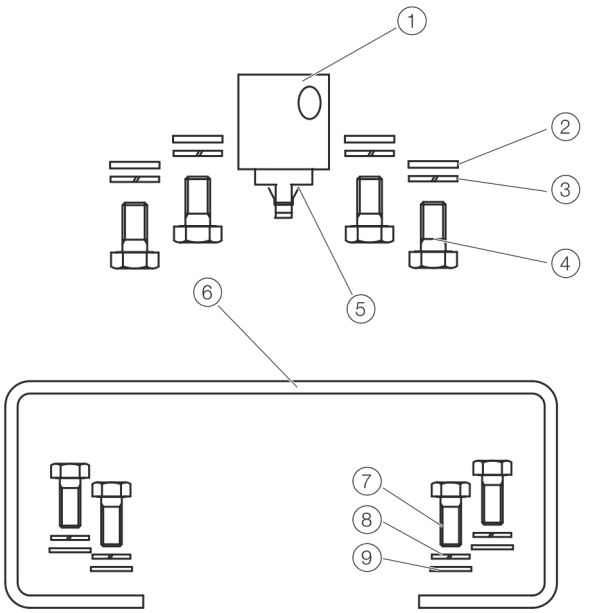


Figure 16: Attachment kit components

- Adapter (1) with spring (5)
- four M6 screws each (4), spring washers (3) and washers (2) to fasten the attachment bracket (6) to the positioner
- four M5 screws (7), Spring washers (8) and washers (9) to fasten the attachment bracket to the actuator

Required tools

- Wrench, size 8 / 10
- Allen key, size 3

Tightening torque for screws

Tighten the screws (4) and (7) to a tightening torque of 7 Nm (±0.5 Nm) during assembly.

Installing the mounting kit

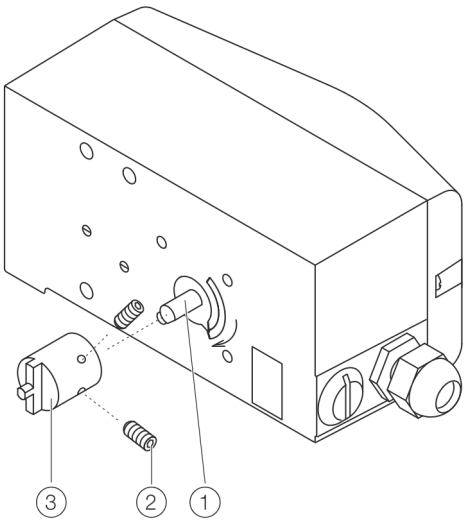
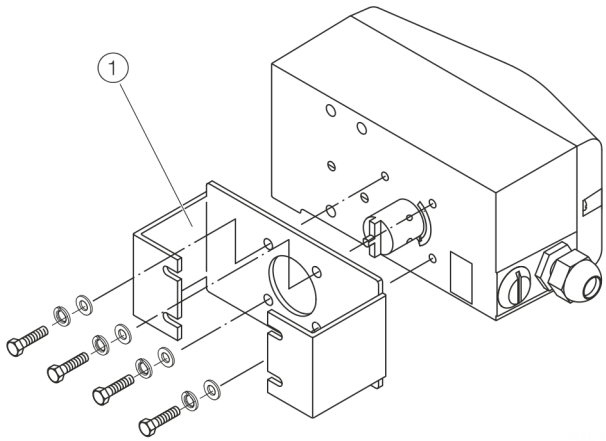


Figure 17: Mounting the adapter on the positioner

1. Determine the mounting position (parallel to actuator or at 90° angle)
2. Calculate the rotational direction of the actuator (right or left).
3. Move the part-turn actuator into the home position.
4. Pre-adjust feedback shaft.
   In order for the positioner to work within the operating range (see **Mechanical mounting** on page 27Installation - Mess- und Arbeitsbereich bis HW-Rev. 5.00</dg_ref_source_inline), the installation position as well as the basic position and rotational direction of the actuator when determining the adapter position on axis (1) must be considered. For this purpose, the feedback shaft can be adjusted manually so that the adapter (3) can be attached in the correct position.
5. Place the adapter in the proper position on the feedback shaft and fasten with threaded pins (2). One of the threaded pins must be locked in place on the flat side of the feedback shaft.

… 8 Installation

… Mechanical mounting



① Attachment bracket

Figure 18: Screwing the mounting bracket onto the positioner

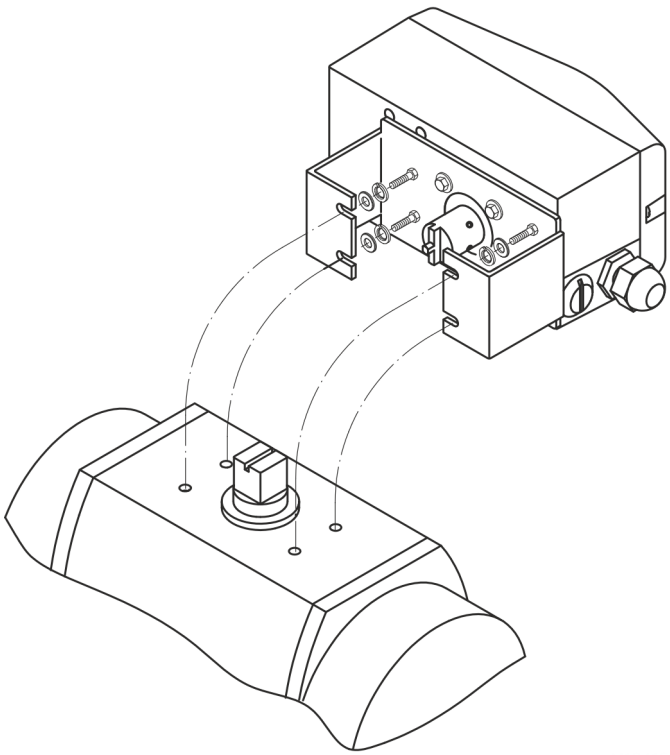


Figure 19: Screwing positioner onto actuator

Note
After mounting, check whether the operating range of the actuator matches the measurement range of the positioner, see **Mechanical mounting** on page 27Installation - Mess- und Arbeitsbereich bis HW-Rev. 5.00</dg_ref_source_inline.

Installing the option modules

Note
The supply voltage must be switched off before the option modules are installed.

1. Loosen the screws for the housing cover and remove it.
2. Position the option module so that the plug points to the right.
3. Using a small amount of pressure, guide the option module into the slot from the side and press it down firmly.
4. Secure the option module in the housing by tightening the screw so that it is hand-tight.
5. Attach the housing cover and screw it on to the housing. Tighten the screws so that they are hand-tight.
6. If you are using the emergency shutdown module, the rotary switch on the main printed circuit board must be rotated into position 1 using a suitable flat-bladed screwdriver.
7. Attach the housing cover and screw it on to the housing. Tighten the screws so that they are hand-tight.

Note
A maximum of two option modules may be used at the same time. The module types must be different.

Note
If you are using the emergency shutdown module, the module must be supplied with 24 V DC at terminals +85 / −86. Otherwise, the positioner will not be able to function pneumatically (device in pneumatic safety position).

Note
Perform a functional check of the emergency shutdown module (option) at least every 2 years. For this purpose, the positioner must move the valve into the safety position when the 24 V DC signal (terminal +85 / −86) is interrupted.

Installing the mechanical position indication

1. Loosen the screws for the housing cover and remove it.
2. Attach the shaft extension to the shaft and secure it using the screw provided.
3. Attach the round position indication to the shaft extension and rotate it into the desired position.
4. Set the new housing cover (with round sight glass) and screw it on to the housing. Tighten the screws so that they are hand-tight.

Installing the mechanical position feedback

1. Loosen the screws for the housing cover and remove it.
2. If one has been installed, remove the optical position indication and unscrew the shaft extension.
3. Move the printed circuit board for position feedback to the right underneath the two plastic clips and secure it using the screw provided.
4. If applicable, install the optical position indication.
5. Attach the housing cover and screw it on to the housing. Tighten the screws so that they are hand-tight.

… 8 Installation

… Installing the option modules

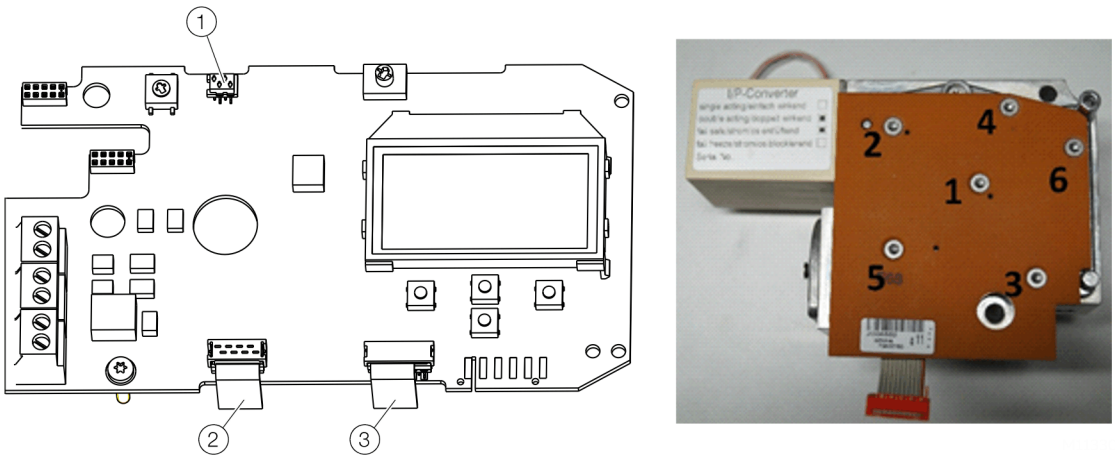
Installing the pressure option

⚠ CAUTION

Risk of injury

Risk of injuries due to flying components as well as significant noise emissions.

- Prior to disassembly, all connected compressed air lines must be depressurized.



① I/P converter pneumatic system

② Position sensor

③ Pressure option

Figure 20: Printed circuit board

Note

- The supply voltage must be switched off before the pressure option is installed.
- The bonding wires for the pressure option must not be touched. Doing so will cause damage to the option module.
- Before using the device, a high-voltage test in accordance with IEC must be performed.

1. Loosen the screws for the housing cover and remove it.
2. Loosen all cable connections on the screw terminals.
3. If present, unscrew the option modules and remove them from the side.
4. If present, remove the mechanical position indication and screw off the shaft extension (as well as the mechanical alarm signaling unit if applicable).
5. Remove the screws for the plastic cover and remove the cover.
6. Remove both plug connectors from the printed circuit board.
7. Unscrew the fixing screws for the printed circuit board and carefully remove the printed circuit board.
8. Unscrew the screws on the upper side of the pneumatics and remove the cover plate.
9. Carefully attach the pressure option to the pneumatics and screw it in place so that the screws are hand-tight.
10. Install the printed circuit board.
11. Attach both plug connectors ①, ② to the printed circuit board (see Figure 20).
12. Attach the plug connectors for the pressure option ③ to the printed circuit board (see Figure 20).
13. Attach the plastic cap.
14. If necessary, install option modules and set the mechanical feedback.
15. Attach the housing cover and screw it on to the housing. Tighten the screws so that they are hand-tight.

Mounting instructions
The screws should be tightened in the sequence as shown numbered in the figure by applying a torque of 1 Nm.

Test instructions / function testing
After the pressure plate is mounted, supply from 4 to 20 mA to the positioner and look for the P / P1 / P2 pressure readings on the device display in the 'Signals Views' menu item. The device does not need to be supplied with compressed air for this purpose. Basically, all 3 pressure readings should be displayed at this point and in this case, everything is OK. Adjustment of the pressure readings is not required, since the plate has already been adjusted at the factory.
If the following display appears, an error has occurred. ('Plate is defective' → In this case, please contact ABB Automation GmbH - Service Instruments -):
P ---
P1 ---
P2 ---

If the pressure plate is not connected with the main circuit board (connector is not inserted), the 3 pressure readings P / P1 / P2 are not displayed in the menu.

EX Requirement
If we are dealing with Ex devices, the customer must have the modification checked by an Ex expert.
If this should not be possible, it is imperative that the modification be tested at the factory!
Contact partner: ABB Automation GmbH - Service Instruments -

Setting the option modules

Setting the mechanical position indication

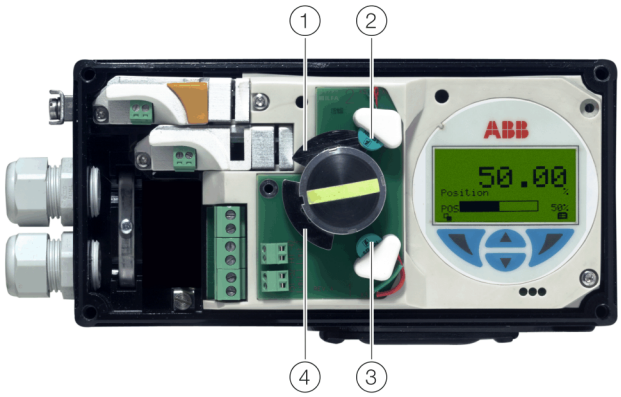
1. Loosen the screws for the housing cover and remove it.
2. Rotate the position indicator on the shaft to the desired position.
3. Attach the housing cover and screw it onto the housing. Tighten the screws so that they are hand-tight.
4. Attach the symbol label to mark the minimum and maximum valve positions on the housing cover.

Note
The labels are located on the inside of the housing cover.

… 8 Installation

… Installing the option modules

Setup of the feedback on the actuator position using proximity switches



① Upper metal tag
② Proximity switch Limit 2
③ Proximity switch Limit 1
④ Lower metal tag

Figure 21: Limit switch with proximity switches

1. Loosen the screws for the housing cover and remove it.

⚠ CAUTION

Risk of injury!
The device includes slot sensors with sharp edges.
- Adjust the metal tags using a screwdriver only!

2. Set the upper and lower switching points for binary feedback as follows:
   - Select the ‘Manual Adjustment’ operating mode and move the final control element by hand into the lower switching position.
   - Using a screwdriver, adjust the metal tag of proximity switch 1 (lower contact) on the axis until contact is made, i. e. just before it is inserted in the proximity switch. The metal tag enters proximity switch 1 when the axis is rotated clockwise (as viewed from the front).
   - Move the final control element by hand into the upper switching position.
   - Using a screwdriver, adjust the metal tag of proximity switch 2 (upper contact) on the axis until contact is made, i. e.just before it is inserted in the proximity switch. The metal tag enters proximity switch 2 when the axis is rotated counter-clockwise (as viewed from the front).
3. Attach the housing cover and screw it onto the housing.
4. Tighten the screws so that they are hand-tight.

Setup of the feedback on the actuator position using microswitches

1. Loosen the screws for the housing cover and remove it.
2. Select the ‘Manual Adjustment’ operating mode and move the final control element by hand into the desired switching position for contact 1.
3. Set maximum contact (①, lower washer).
   Fasten the upper washer with the special adjustment retainer and rotate the lower washer manually.
4. Select the ‘Manual Adjustment’ operating mode and move the final control element by hand into the desired switching position for contact 2.
5. Set minimum contact (②, upper washer);
   Fasten the lower washer with the special adjustment retainer and rotate the upper washer manually.
6. Connect the microswitch.
7. Attach the housing cover and screw it on to the housing.
8. Tighten the screws so that they are hand-tight.

9 Electrical connections

Safety instructions

⚠ DANGER

Risk of explosion for devices with local communication interface (LCI)

A local communication interface (LCI) may not be operated in hazardous areas.

- Never use the local communication interface (LCI) on the main board in a hazardous area!

⚠ WARNING

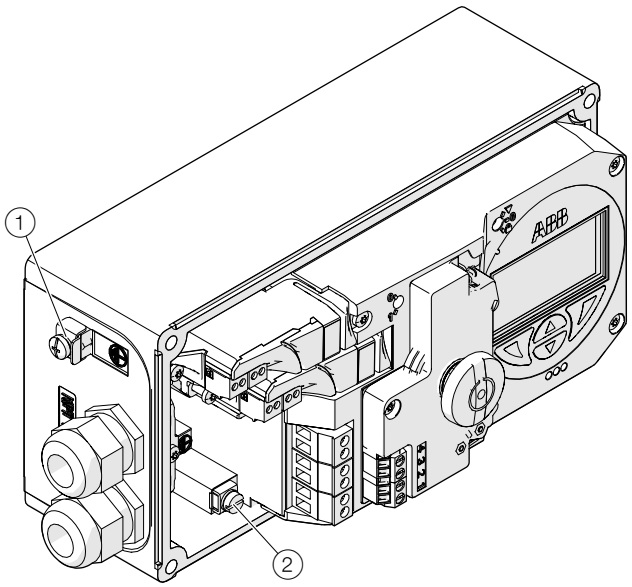
Risk of injury due to live parts!

When the housing is open, contact protection is not provided and EMC protection is limited.

- Before opening the housing, switch off the power supply.

The electrical connection may only be established by authorized specialist personnel.
Notices on electrical connection in this instruction must be observed; otherwise, electric safety and the IP-rating may be adversely affected.
Safe isolation of electric circuits which are dangerous if touched is only guaranteed when the connected devices fulfill the requirements of EN 61140 (basic requirements for secure separation).
To ensure safe isolation, install supply lines so that they are separate from electrical circuits which are dangerous if touched, or implement additional isolation measures for them.

Potential equalization



① External potential equalization terminal
② Internal potential equalization terminal

Figure 22: Potential equalization terminal

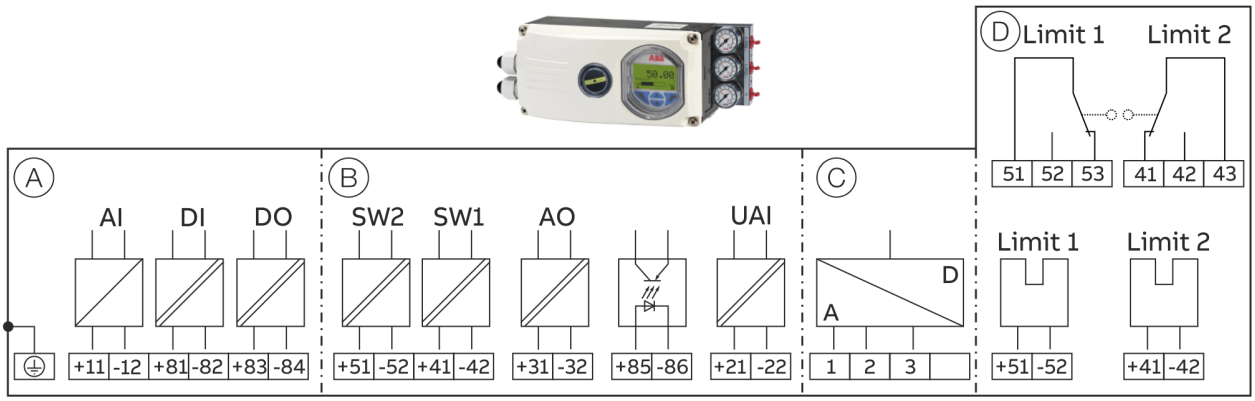
For the potential equalization (PA) of the EDP300 or the connection of a protective earth, a potential equalization terminal is available both on the exterior of the housing and in the connection space. Both terminalss are galvanically connected to each other.

These connection points can be used if grounding or the connection of a protective conductor is prescribed by national regulations for the selected type of supply or the type of protection used.

1. Loosen the screw terminal.
2. Insert the forked cable lug for functional grounding between the two metal tabs and into the loosened terminal.
3. Tighten the screw terminal.

… 9 Electrical connections

Positioner / EDP300 Control Unit Electrical Connection



Ⓐ Basic device

Ⓑ Options

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

Ⓓ Options, limit monitor with proximity switches or microswitches (not for EDP300 Control Unit)

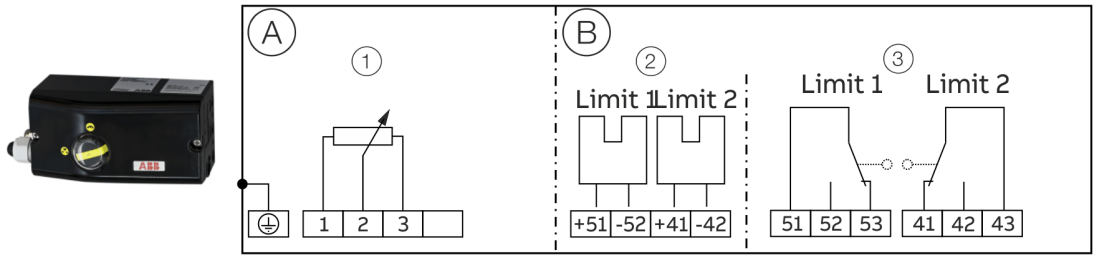
Figure 23: EDP300 Electrical Connection

Connections for inputs and outputs

Terminal	Function / comments
+11 / −12	**Analog input AI or field bus connection**
+81 / −82	**Digital input DI**
+83 / −84	**Digital output DO2**
+51 / −52	**Limit alarm SW1** (Option module)
+41 / −42	**Limit alarm SW2** (Option module)
+31 / −32	**Analog feedback AO** (Option module)
+85 / −86	**Emergency shutdown module** (Option module)
+21 / −22	**Universal input UAI**
1 / 2 / 3	**EDP300 remote sensor** (Only for options EDP300 Remote Sensor or EDP300 for remote position sensor)

Terminal	Function / comments
+51 / −52	**Limit switch Limit 1 with proximity switch** (optional)
+41 / −42	**Limit switch Limit 2 with proximity switch** (optional)
51 / 52 / 53	**Limit switch Limit 1 with microswitch** (optional)
41 / 42 / 43	**Limit switch Limit 2 with microswitch** (optional)

EDP300 Remote Sensor Electrical Connection



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

Figure 24: EDP300 Remote Sensor Electrical Connection

Connections for inputs and outputs

Terminal	Function / comments
1 / 2 / 3	**EDP300 Control Unit**
+51 / −52	**Limit switch Limit 1 with proximity switch** (optional)
+41 / −42	**Limit switch Limit 2 with proximity switch** (optional)
51 / 52 / 53	**Limit switch Limit 1 with microswitch** (optional)
41 / 42 / 43	**Limit switch Limit 2 with microswitch** (optional)

… 9 Electrical connections

Electrical data for inputs and outputs

Note

When using the device in potentially explosive atmospheres, note the additional data in **Use in potentially explosive atmospheres in accordance with ATEX and IECEx** on page 6 and **Use in potentially explosive atmospheres in accordance with cFMus** on page 13!

Basic device

Set point signal analog (two-wire technology)	
Terminals	+11 / −12
Nominal operating range	4 to 20 mA
Limit values	Maximum: 50 mA (overload) Minimum: 3.6 mA
Starting at	≥ 3.8 mA
Load voltage	9.7 V at 20 mA
Impedance	485 Ω at 20 mA

Digital input DI	
Terminals	+81 / −82
Supply voltage	24 V DC (12 to 30 V DC)
Input ‘logical 0’	0 to 5 V DC
Input ‘logical 1’	11 to 30 V DC
Input Current	Maximum 4 mA

Digital output DO	
Terminals	+83 / −84
Supply voltage	5 to 30 V DC (Control circuit to DIN 19234/NAMUR)
Switching state logical	‘0’: current > 0.35 mA to < 1.2 mA ‘1’: Current > 2,1 mA
Direction of action	standard logical ‘0’ or logical ‘1’ (configurable)

Option modules

Module for analog feedback AO*

Without any signal from the positioner (e.g. ‘no power’ or ‘initializing’) the module sets the output to > 20 mA (alarm level).

Terminals	+31 / −32
Signal range	4 to 20 mA (split ranges can be parameterized)
Supply voltage, two-wire technology	24 V DC (10 to 30 V DC)
Characteristic curve	rising or falling (configurable)
Deviation	< 1 %

Module for digital feedback SW1, SW2*

Two switches for binary position feedback (position adjustable within the range of 0 to 100 %, ranges cannot overlap)

Terminals	+41 / −42, +51 / −52
Supply voltage	5 to 11 V DC (Control circuit to DIN 19234/NAMUR)
Signal current	< 1,2 mA: Switching state logical ‘0’ > 2,1 mA: Switching state logical ‘1’
Direction of action	standard logical ‘0’ or logical ‘1’ (configurable)

Module for universal input UAI*

Module for a 4 to 20 mA input for universal use.
The range can be scaled. It is used for advanced valve diagnostics. For example, an ultrasonic sensor can be connected to detect a faulty valve seat or a phonometer can be connected to detect cavitation.
The limit values for detecting up-scaling can be freely selected.

Terminals	+21 / −22
Nominal operating range	4 to 20 mA
Load voltage	8 V at 20 mA
Impedance	400 Ω at 20 mA

Module for the emergency shutdown function*

When the 24 V DC signal is interrupted, the I/P module executes the respective safety function, depending on the mechanical construction.

The positioner output 1 is depressurized, and the valve is moved to the safe position. In case of a double-acting actuator, output 2 is additionally pressurized.

The emergency shutdown module works independently of the mother board, i.e., all information from the final control element is available in the control system at any time.

Terminals	+85 / −86
Supply voltage	24 V DC (20 to 30 V DC) (electrically isolated from the input signal)
Safe position	Active at < 5 V DC

* There are two slots for the option modules. Any combination of different option modules is possible. However, identical option modules cannot be combined.

Limit switch

The limit switch can either be equipped with proximity switches or with potential-free microswitches.

Limit switch Limit 1 / Limit 2 with proximity switches

Two proximity switches for independent position signaling.		
Terminals		+41 / −42, +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
Switching point		Adjustable between 0 and 100 %
Direction of action	Metal tag in proximity switch	Metal tag outside proximity switch
Type SJ2-SN (NC; log. 1)	< 1.2 mA	> 2.1 mA

Limit switch Limit 1 / Limit 2 with 24 V - microswitches

Terminals	41 / 42 / 43, 51 / 52 / 53
Supply voltage	maximum 24 V AC/DC
Load rating	Maximum 2 A

Conductor cross-section

Basic device

Electrical connections	
4 to 20 mA input	Screw terminals max. 2.5 mm^2 (AWG14)
Options	Screw terminals max. 1.0 mm^2 (AWG18)

Cross section	
Rigid / flexible wires	0.14 to 2.5 mm^2 (AWG26 to AWG14)
Flexible with wire end sleeve	0.25 to 2.5 mm^2 (AWG23 to AWG14)
Flexible with wire end sleeve no plastic sleeve	0.25 to 1.5 mm^2 (AWG23 to AWG17)
Flexible with wire end sleeve with plastic sleeve	0.14 to 0.75 mm^2 (AWG26 to AWG20)

Multi-wire connection capacity (two wire with the same cross-section)	
Rigid / flexible wires	0.14 to 0.75 mm^2 (AWG26 to AWG20)
Flexible with wire end sleeve no plastic sleeve	0.25 to 0.75 mm^2 (AWG23 to AWG20)
Flexible with wire end sleeve with plastic sleeve	0.5 to 1.5 mm^2 (AWG21 to AWG17)

Option modules

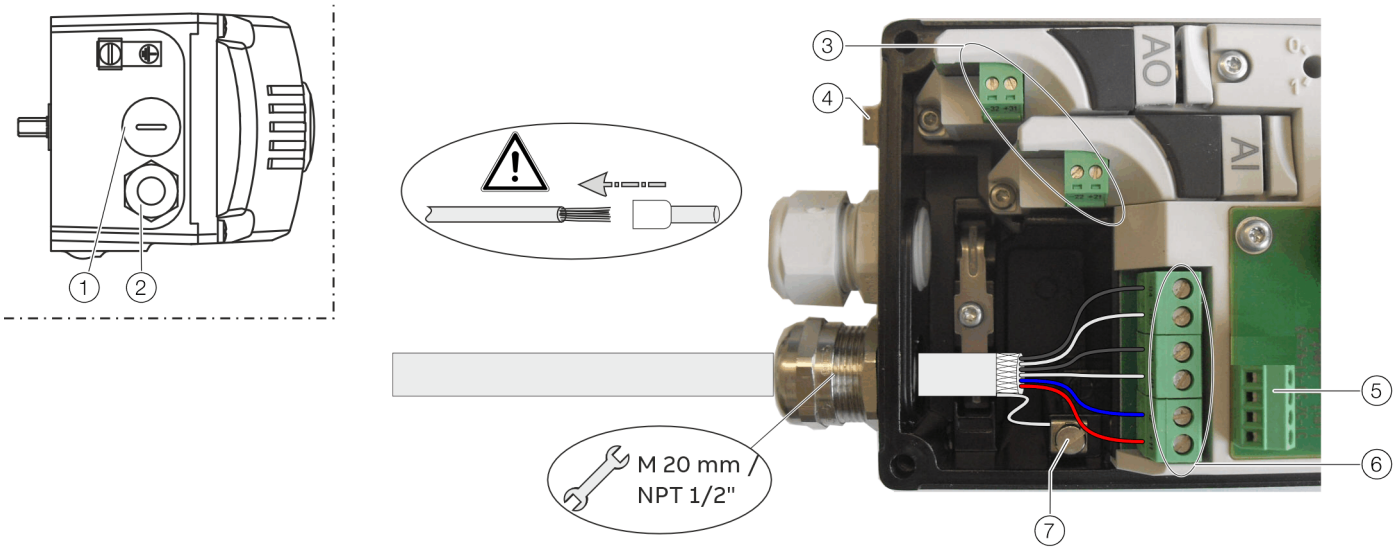
Cross section	
Rigid / flexible wires	0.14 to 1.5 mm^2 (AWG26 to AWG17)
Flexible with wire end sleeve no plastic sleeve	0.25 to 1.5 mm^2 (AWG23 to AWG17)
Flexible with wire end sleeve with plastic sleeve	0.25 to 1.5 mm^2 (AWG23 to AWG17)

Multi-wire connection capacity (two wire with the same cross-section)	
Rigid / flexible wires	0.14 to 0.75 mm^2 (AWG26 to AWG20)
Flexible with wire end sleeve no plastic sleeve	0.25 to 0.5 mm^2 (AWG23 to AWG22)
Flexible with wire end sleeve with plastic sleeve	0.5 to 1 mm^2 (AWG21 to AWG18)

Feedback on the actuator position using proximity switches or microswitches	
Rigid wire	0.14 to 1.5 mm^2 (AWG26 to AWG17)
Flexible wire	0.14 to 1.0 mm^2 (AWG26 to AWG18)
Flexible with wire end sleeve no plastic sleeve	0.25 to 0.5 mm^2 (AWG23 to AWG22)
Flexible with wire end sleeve with plastic sleeve	0.25 to 0.5 mm^2 (AWG23 to AWG22)

… 9 Electrical connections

Connection on the device



1. Blind plug
2. Cable gland
3. Terminals for options modules
4. External potential equalization terminal
5. Terminals attachment set for digital feedback
6. Terminals basic device
7. Internal potential equalization terminal / shield terminal

Figure 25: Connection on device (example)

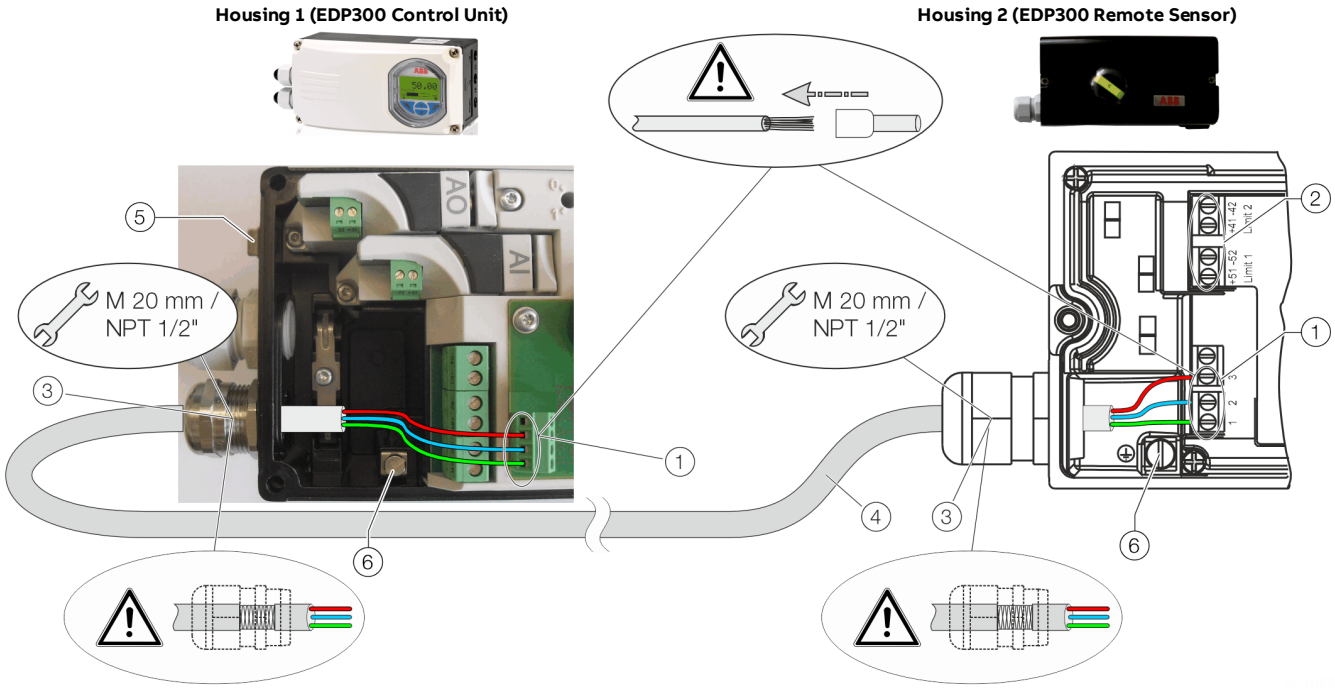
2 tap holes ½- 14 NPT or M20 × 1.5 are provided on the left side of the housing for cable entry in the housing.

Note

The connecting terminals are delivered closed and must be unscrewed before inserting the wire.

1. Strip the wires to approximately 6 mm (0.24 in).
2. After stripping the cable end, fit the appropriate wire end sleeves and crimp
3. Connect the wires to the connecting terminals in line with the connection diagram.
   Tightening torque for the terminal screws:
   0.5 to 0.6 Nm

Connection to device – EDP300 Control Unit with EDP300 Remote Sensor



1. Terminals EDP300 Remote Sensor
2. Terminal attachment kit for digital feedback
3. EMC Cable gland
4. Shielded connection cable
5. External potential equalization terminal
6. Internal potential equalization terminal

Figure 26: Connection EDP300 Control Unit with EDP300 Remote Sensor (example)

In the case of the 'EDP300 Control Unit with EDP300 Remote Sensor' design, the components are supplied in two housings, which together form one harmonized unit.
Housing 1 (EDP300 Control Unit) contains the electronics and pneumatics along with the following optional modules (where applicable):

- Analog position feedback
- Digital position feedback
- Emergency shutdown module
- Universal input

Housing 2 (EDP300 Remote Sensor) contains the position sensor and is suitable for mounting on linear or rotary actuators.
If necessary, the following options can be installed if required:

- Optical position indicator
- Mechanical feedback contacts designed as proximity switches or microswitches.

The housings of the EDP300 Control Unit and the EDP300 Remote Sensor are available in stainless steel as an option.

Cable specification
To connect the EDP300 Remote Sensor, a cable with the following specifications needs to be used:

- 3-wire, cross-section 0.5 to 1.0 mm²
- Shielded, with at least 85 % coverage
- Temperature range up to at least 100 °C (212 °F)

The cable glands used must also be approved for a temperature range up to at least 100 °C (212 °F). The cable glands require a mounting for the shielding and strain relief for the cable in addition.
ABB offers suited cables and cable glands with DNV certification for the EDP300 Remote Version.

… 9 Electrical connections

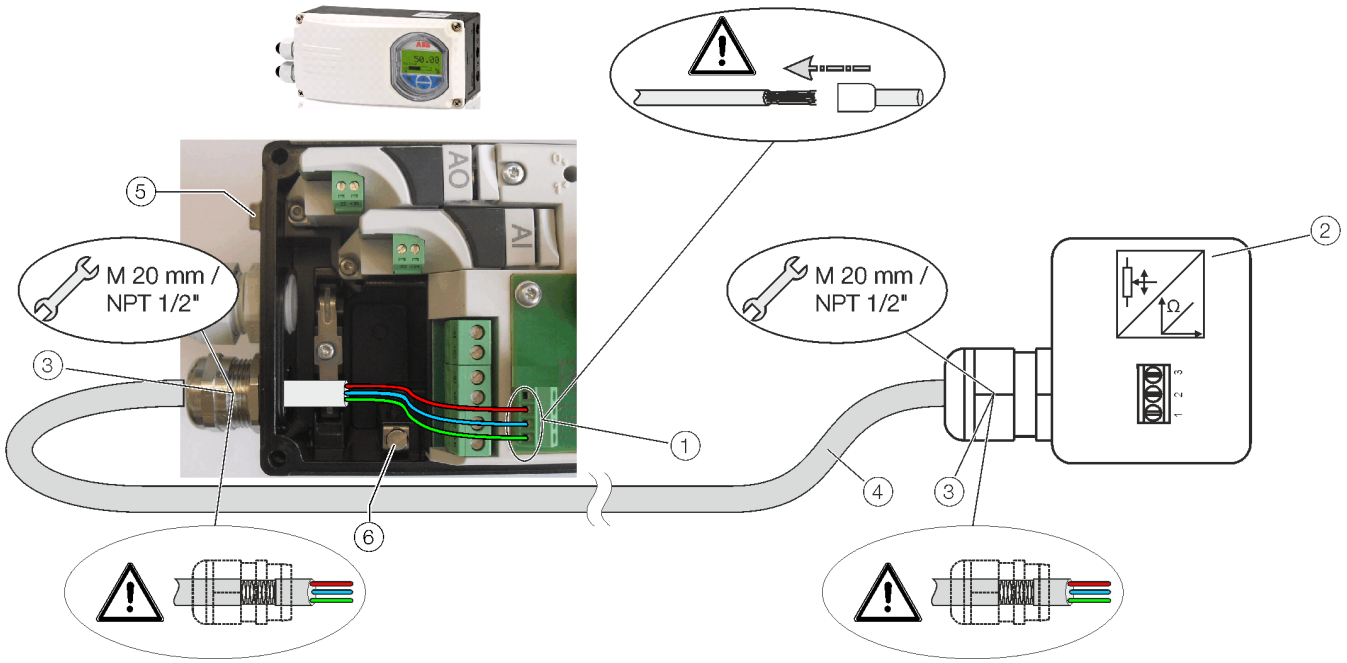
… Connection to device – EDP300 Control Unit with EDP300 Remote Sensor

Electrical connection

Connect the positioner (EDP300 Control Unit, housing 1) and remote position sensor (EDP300 Remote Sensor, housing 2), while following the instructions below:

- The EDP300 Remote Sensor and the EDP300 Control Unit are adjusted to each other. Ensure that only devices with the same serial number are connected.
- A shielded 3-wire cable with a maximum length of 10 m (33 ft) must be used for the connection.
- Route the cable into the terminal compartment through the EMC cable glands. Ensure that the shielding is secured correctly in the EMC cable glands.
- Connect the cables in accordance with the electrical connections and tighten the screws of the terminals so that they are hand-tight.
- Use wire end ferrules when connecting.
- The electrical connections of the EDP300 Control Unit and the optional modules are carried out as described in **Positioner / EDP300 Control Unit Electrical Connection** on page 38.
- If the EDP300 Control Unit is fastened so that it is it non-conductive, the housing must be grounded (EDP300 Control Unit and EDP300 Remote Sensor housing with the same electric potential); otherwise control deviations could occur with regard to analog position feedback.
- In the EDP300 Remote Sensor in IP rating IP 66, pre-tighten the cover screws by applying approx. 50 Ncm (0.44 lbf-in) cross-wise and then tighten by applying 200 Ncm (1.77 lbf-in).
- The pneumatic outputs to the actuator must be connected using pneumatic lines with a minimum diameter of 6 mm.

Connection on device – EDP300 Control Unit for remote position sensor



1. Terminals for remote position sensor
2. Remote position sensor
3. EMC Cable gland
4. Shielded connection cable
5. External potential equalization terminal
6. Internal potential equalization terminal

Figure 27: Connection of EDP300 Control Unit with remote position sensor (example)

With the EDP300 designed for remote position sensors, the positioner is supplied without a position sensor.

The EDP300 Control Unit contains the electronics and pneumatics along with the following options (where applicable):

- Analog position feedback
- Digital position feedback
- Emergency shutdown module
- Universal input

Any position sensor (4 to 80 kΩ) may be connected.

Cable specification

To connect the EDP300 Remote Sensor, a cable with the following specifications needs to be used:

- 3-wire, cross-section 0.5 to 1.0 mm²
- shielded, with at least 85 % coverage
- Temperature range up to at least 100 °C (212 °F)

The cable glands used must also be approved for a temperature range up to at least 100 °C (212 °F). The cable glands require a mounting for the shielding and strain relief for the cable in addition.
ABB offers suited cables and cable glands with DNV certification for the EDP300 Remote Version.

Electrical connection

Connect the positioner (EDP300 Control Unit) and remote position sensor while observing the following instructions:

- A shielded 3-wire cable with a maximum length of 10 m (33 ft) must be used for the connection.
- Route the cable into the terminal compartment through the EMC cable glands. Ensure that the shielding is secured correctly in the EMC cable glands.
- Connect the cables in accordance with the electrical connections and tighten the screws of the terminals so that they are hand-tight.
- The electrical connections of the EDP300 Control Unit and the optional modules are carried out as described in **Positioner / EDP300 Control Unit Electrical Connection** on page 38.
- Use wire end ferrules when connecting.
- If the EDP300 Control Unit is fastened so that it is it non-conductive, the housing must be grounded (EDP300 Control Unit and remote position sensor with the same electric potential); otherwise control deviations could occur with regard to analog position feedback.
- If the device is being operated on a cylinder, for reasons associated with linearity you should run automatic adjustment for the rotary actuator.
- The pneumatic outputs to the actuator must be connected using pneumatic lines with a minimum diameter of 6 mm.

10 Pneumatic Connections

Note

The positioner must only be supplied with instrument air that is free of oil, water, and dust (in gas configuration with dried natural gas).

The purity and oil content must meet the requirements of Class 3 according to DIN/ISO 8573-1.

NOTICE

Damage to components!

Contamination on the air pipe and positioner can damage components.

- Dust, splinters, and any other particles of dirt must be blown-out before the pipe is connected.

NOTICE

Damage to components!

Pressure above 10 bar (145 psi) can damage the positioner or actuator.

- Provisions must be made, e.g. by using a pressure reducer, to make sure that the pressure does not rise above 10 bar (145 psi), even in the event of a fault.

Information on double acting actuators with spring-return mechanism

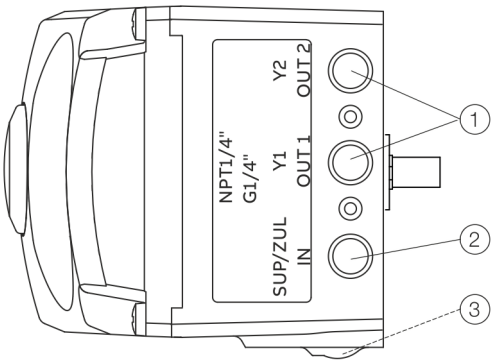
On double-acting actuators with spring-return mechanism, a pressure that significantly exceeds the supply air pressure value can be generated during operation by the springs in the chamber opposite the springs.

This may damage the positioner or adversely affect control of the actuator.

To eliminate the possibility of this occurring, it is recommended to install a pressure compensation valve between the springless chamber and the supply air for these types of applications. It enables the increased pressure to be transferred back to the air inlet line.

The opening pressure of the check valve should be < 250 mbar (< 3.6 psi).

Connection on the device



1 Pneumatic outputs

2 Supply air

3 Filter screw (on underside of housing)

Figure 28: Pneumatic connections

Marking	Pipe connection
SUP / ZUL IN	Supply air, pressure 1.4 to 10 bar (20 to 145 psi)
Y1 / OUT1	Output pressure to the actuator
Y2 / OUT2	Output pressure to the actuator (2 Connection with double acting actuator)

Join the pipe connections according to the designation, observing the following points:

- All pneumatic piping connections are located on the right-hand side of the positioner. G¼ or ¼ 18 NPT tap holes are provided for the pneumatic connections. The positioner is labeled according to the tap holes available.
- We recommend that you use a pipe with dimensions of 12 × 1.75 mm. The supply air pressure required to apply the actuating force must be adjusted in line with the output pressure in the actuator.
- The operating range of the positioner is between 1.4 to 10 bar (20 to 145 psi).

Air supply

Instrument air[1), 2)]	
Purity	Maximum particle size: 5 µm Maximum particle density: 5 mg/m^3
Oil content	Maximum concentration 1 mg/m^3
Pressure dew point[2)]	10 K below operating temperature
Supply pressure	Standard design: 1.4 to 10 bar (20 to 145 psi) Marine version: 1.5 to 8 bar (22 to 116 psi)
Air consumption[3)]	< 0.03 kg/h / 0.015 scfm

1) Free of oil, water and dust in accordance with DIN / ISO 8573-1. Pollution and oil content n accordance with Class 3
2) Nitrogen is permitted as instrument air. When operating with nitrogen, the pressure dew point specifications for operation with instrument air apply.
3) Independent of supply pressure

Compressed air output	
Range	0 to 10 bar (0 to 145 psi)
Air capacity	Standard: 40 kg/h (31 Nm^3/h / 20 scfm) Optional: 50 kg/h (40 Nm^3/h / 23 scfm)
Output function	For single acting or double acting actuators Air is vented from actuator or actuator is blocked in case of (electrical) power failure
Shut-off values	End position 0 % = 0 to 45 % End position 100 % = 55 to 100 %

11 Commissioning

Safety instructions

Note
The electrical power supply and supply air pressure data indicated on the name plate must be complied with during commissioning.

Before switching on the device, make sure that your installation complies with the environmental conditions listed in the chapter “Technical Data” or on the data sheet.
If there is a chance that safe operation is no longer possible, take the device out of operation and secure it against unintended startup.

Checks prior to commissioning

Air pressure in the compressed air connecting line:

- 1.4 to 10 bar (20 to 145 psi)
- Marine version: 1.6 to 8 bar (23 to 116 psi)

Current input active: 4 to 20 mA

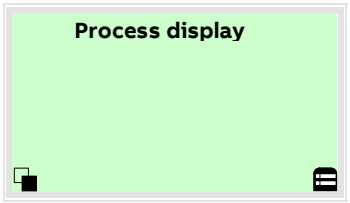
Mechanical mounting checks

During commissioning, the mechanical mounting on the linear and rotary actuators is checked. For this purpose, the actuator is first moved into the end positions and Auto Adjust is then carried out.
With large actuators, it can occur that the time for automatic adjustment is significantly than in smaller actuators.

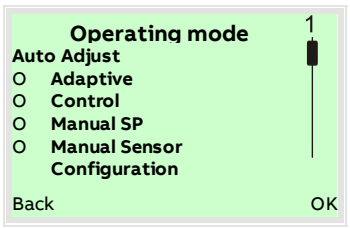
… 11 Commissioning

… Mechanical mounting checks

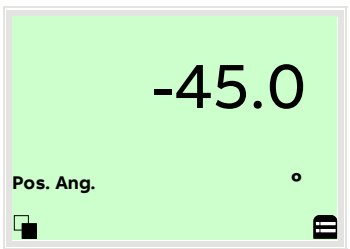
Moving to end positions after completion of automatic adjustment



1. Use ◤ to switch to the Operating Mode menu.



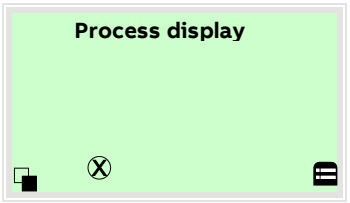
2. Use ▲ or ▼ to select the ‘Manual Sensor’ operating mode.
3. Use ▲ and ▼ to move to the relevant end positions.



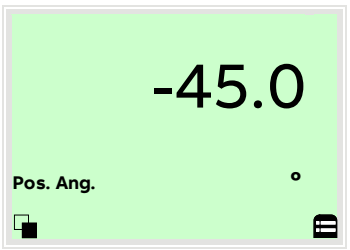
Check the end positions. The angle of rotation is displayed in degrees.
Recommended range:

- between −30 to 30° for linear actuator
- between −45 to 45° for rotary actuator

Moving to end positions with a new device



1. Use ▲ and ▼ to move to the relevant end positions.



Check the end positions. The angle of rotation is displayed in degrees.
Recommended range:

- between −30 and 30° for linear actuator
- between −45 and 45° for rotary actuator

Auto Adjust must then be performed.
See **Start automatic adjustment** on page 53.

12 Operation

Safety instructions

⚠ CAUTION

Risk of injury due to incorrect parameter values!

Incorrect parameter values can cause the valve to move unexpectedly. This can lead to process failures and result in injuries.

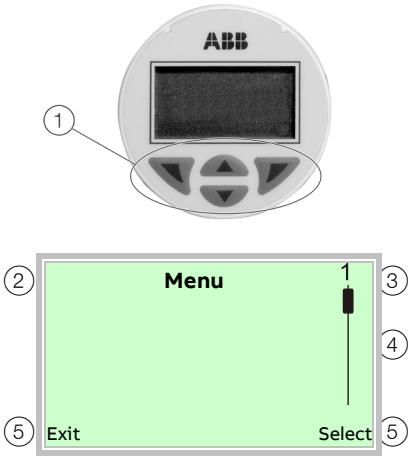
- Before recommissioning a positioner that was previously in use at another location, always reset the device to its factory settings.
- Never start automatic adjustment before restoring the factory settings!

If there is a chance that safe operation is no longer possible, take the device out of operation and secure it against unintended startup.

Parameterization of the device

The LCD display features operating buttons which enable the device to be operated with the housing cover open.

Menu navigation



1. Operating buttons for menu navigation
2. Indication of menu designation
3. Indication of menu number
4. Marking to indicate relative position within the menu
5. Indication of the current function assigned to the operating buttons and

Figure 29: LCD indicator (example)

You can use the or operating buttons to browse through the menu or select a number or character within a parameter value.
Different functions can be assigned to the and operating buttons. The function that is currently assigned (5) is shown on the LCD display.

Operating button functions

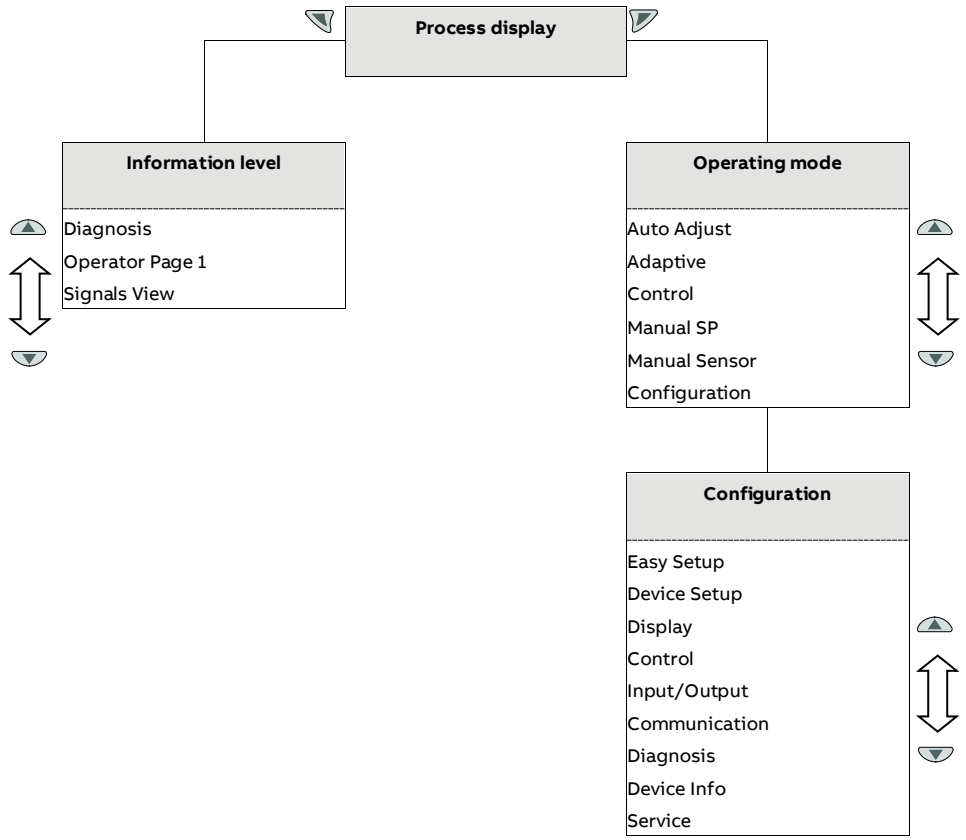
	Meaning
Exit	Exit menu
Back	Go back one submenu
Cancel	Cancel parameter entry
Next	Select the next position for entering numerical and alphanumeric values

	Meaning
Select	Select submenu / parameter
Edit	Edit parameter
OK	Save parameter entered

… 12 Operation

Menu levels

There are three menu levels below the process display.



Process display
The process display shows the current process values.

Information level
The information level contains the parameters and information that are relevant for the operator. The device configuration cannot be changed on this level.

Operating modes menu
In the operating modes menu, the Auto Adjust function can be started for commissioning purposes. You can also change the operating modes and switch to the configuration level.

Configuration level
The configuration-, parameterization instruction contains all the parameters required for device commissioning and configuration. The device configuration can be changed on this level.

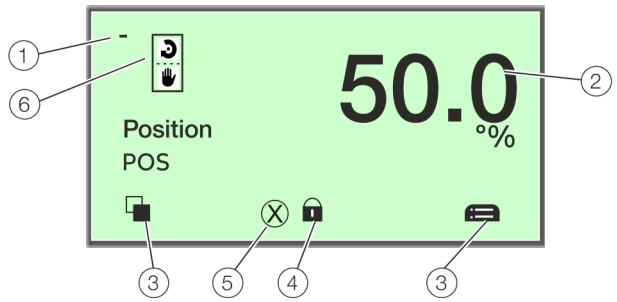
NOTICE

Property damage
During external configuration via a PC, the positioner no longer responds to the set point current. This may lead to process failures.

- Before any external parameterization, always move the actuator to the safety position and activate manual adjustment.

Note
For a detailed description of the individual parameters and menus on the configuration level, please refer to **Parameter descriptions** on page 60.

Process display



① Indication of measuring point tagging
② Indication of current process values
③ Symbol indicating button function
④ Symbol indicating 'Parameterization protected'
⑤ Diagnosis notice
⑥ Operating mode symbol

Figure 30: Process display (example)

The process display appears on the LCD display when the device is powered on. It shows information about the device and current process values.
The way in which the current process values (②) are shown can be adjusted on the configuration level.

Description of symbols

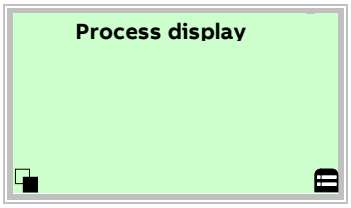
Symbol	Description
	Call up information level. When Autoscroll mode is enabled, a ↻symbol appears here and the operator pages are automatically displayed one after the other.
	Call up configuration level.
	The device is protected against changes in the parametrization.

Description of the message symbols

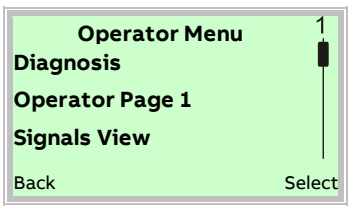
Symbol	Message symbol
	Universal input activated
	Diagnostic message pending
	Error pending
	Maintenance message pending

Switching to the information level (Operator Menu)

On the information level, the operator menu can be used to display diagnostic information and choose which operator pages to display.



1. Use ◥ to go to the information level.



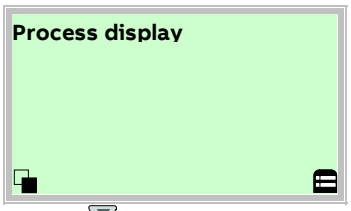
2. Use ▲ or ▼ select a submenu.
3. Confirm the selection with ◢.

Menu	Description
... / Operator Menu	
Diagnosis	Displays the alarms and messages that are currently pending and which occurred in the past. The messages to be displayed can be selected on the configuration level, under 'Diagnosis'.
Operator Page 1	Switches to the process display.
Signals View	Selection of submenu 'Signals View' (only for service purposes). The following signal values (plus units) can be displayed: • Position Pos[%] • Position Pos[°] • Set point SP[%] • Set point SP[mA] • Control deviation DEV [%] • Electronic unit temperature [°C, °F, °R, K] • Supply pressure PIN [unit] • Pressure output 1 PY1 [unit] • Pressure output 2 PY2 [unit] • Differential pressure DP [unit] • Universal input value UIN [unit]

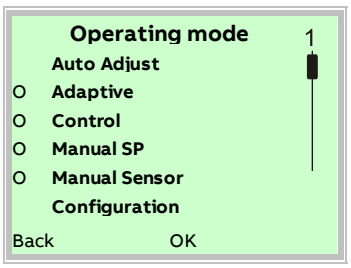
… 12 Operation

Switching the operating mode

The operating mode is displayed and changed in the operating modes menu.
Additionally, it is possible to switch to the configuration level from there.



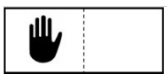
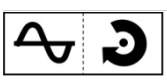
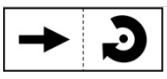
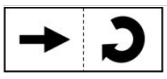
1. Use ▽ to switch to the Operating Mode menu.



2. Use △ or ▽ to select the required operating mode.
3. Confirm the selection with ▽.

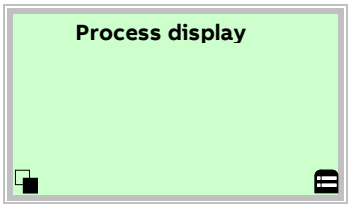
Description of operating modes

Symbol	Operating mode
	**Adaptive control active** When the PositionMaster EDP300 positioner is operated in 'Adaptive Mode', the control parameters are automatically optimized to the operating conditions in small increments. This is especially helpful if valves and fittings could not be operated with reference conditions while the Auto Adjust function was in progress. The long-term stability of the adaptive operating mode results more from the system structure than from the changing behavior of the system, meaning that if a stable, adaptive operating mode can be obtained over several days of control variations in the system application with positioner, actuator, valve and changes in behavior, we can assume stable operation in the application mentioned above. If that is not the case, the 'Non-adaptive control' option should be selected.
	**Fixed control** In contrast to the 'Adaptive control' operating mode, the control parameters are not automatically adjusted.
	**Manual set point, adaptive control** The valve is adjusted manually within the stroke range using the △ or ▽ direction buttons. 1. .Press and hold the relevant operating button for the desired direction. 2. .Additionally, press ▽ if the device is to be switched to high-speed mode. **⚠ CAUTION** **Danger of crushing!** Configured stroke limit positions and stroke times are not effective in manual mode. When the actuator moves, there is a risk of crushing. • You must make sure that there are no people present within the operating range of the actuator.

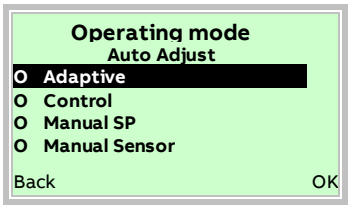
Symbol	Operating mode
	**Manual set point, fixed control** The valve is adjusted manually within the stroke range using the ▲ or ▼ direction buttons. 1. Press and hold the relevant operating button for the desired direction. 2. .Additionally, press ◤ if the device is to be switched to high-speed mode. **⚠ CAUTION** **Danger of crushing!** Configured stroke limit positions and stroke times are not effective in manual mode. When the actuator moves, there is a risk of crushing. • You must make sure that there are no people present within the operating range of the actuator.
	**Moving the actuator manually** The valve is adjusted manually within the valve range using the ▲ or ▼ direction buttons. The position indicator shows the position in angular degrees for the purpose of checking the mounting conditions. 1. Press and hold the relevant operating button for the desired direction. 2. .Additionally, press ◤ if the device is to be switched to high-speed mode. **⚠ CAUTION** **Danger of crushing!** If air escapes due to a leakage, the position will not be readjusted. Configured stroke limit positions and stroke times are not effective in manual mode. When the actuator moves, there is a risk of crushing. • You must make sure that there are no people present within the operating range of the actuator.
	**Set point via HART, adaptive control**
	**Set point via HART, fixed control**
	**Activated binary input, adaptive control**
	**Activated binary input, fixed control**

Start automatic adjustment

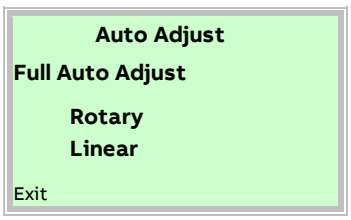
The Auto Adjust function of the device can be configured and started in the 'Operating mode' menu.



1. Use ◤ to switch to the Operating Mode menu.



2. Use ▲ or ▼ to select the 'Adaptive' operating mode.
3. Confirm the selection with ◤. Press and hold down the control button for at least 4 seconds (wait for the time to count down on the top left of the display).



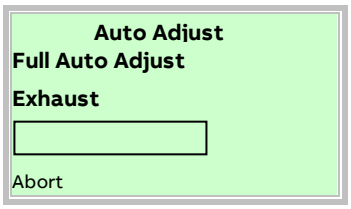
4. Use ▲ or ▼ to select 'Actuator type'.

Select 'Rotary' for rotary actuators.
Select 'Linear' for linear actuators.

… 12 Operation

… Start automatic adjustment

Note
The ‘Autoadjust Mode’ can be preset at the configuration level in ‘… / Easy Setup / Autoadjust Mode’.



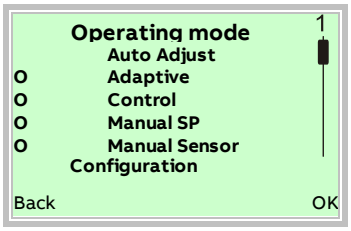
The progress of the Auto Adjust function is shown in a bar graph. The function can be terminated with ‘Abort’ if necessary. Once Auto Adjust has been completed successfully, ‘Auto Adjust Complete’ is displayed. The device then switches to the process display automatically.

Note
Auto Adjust does not always result in optimum control conditions.

When Auto Adjust is started via shortcut keys, the position of the valve is determined automatically.

Switching to the configuration level (parameterization)

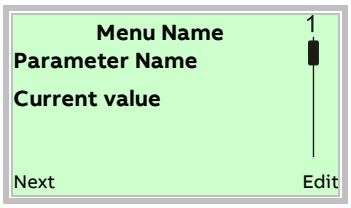
The device parameters can be displayed and changed on the configuration level.



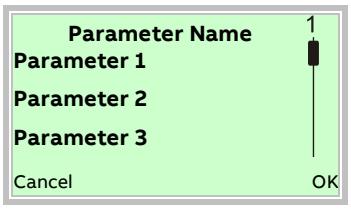
5. Use ▲ or ▼ to select the ‘Configuration’ operating mode.
6. Confirm the selection with ◤.

Selecting and changing parameters

Tabular entry
When an entry is made from a table, a value is selected from a list of parameter values.



1. Select the parameters you want to set in the menu.
2. Use ◤ to call up the list of available parameter values. The parameter value that is currently set is highlighted.

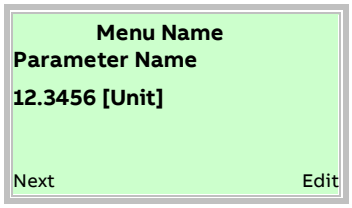


3. Use ▲ or ▼ to select the desired value.
4. Confirm the selection with ◤.

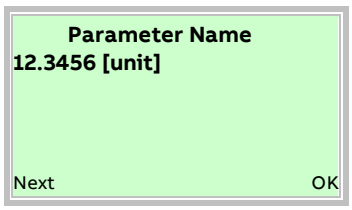
This concludes the procedure for selecting a parameter value.

Numerical entry

When a numerical entry is made, a value is set by entering the individual decimal positions.



1. Select the parameters you want to set in the menu.
2. Use to call up the parameter for editing. The decimal place that is currently selected is highlighted.

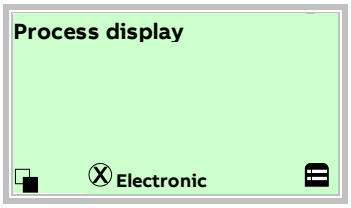


3. Use to select the next decimal place to change.
4. Use or to set the desired value.
5. Use to select the next decimal place.
6. Select and set additional decimal places as needed in accordance with steps 3 to 4.
7. Use to confirm your setting.

This concludes the procedure for changing a parameter value.

Error messages on the LCD display

In the event of an error, a message consisting of a symbol and text appears at the bottom of the process screen (e. g. electronics) The text displayed provides information about the area in which the error has occurred.



The error messages are divided into four groups in accordance with the NAMUR classification scheme. The group assignment can only be changed using a DTM or EDD:

Symbol	Fault message	Description
	Failure	Errors
	Fcheck	Check for errors
	OOSp	Outside of the specification
	MtReq	Maintenance required

The error messages are also divided into the following areas:

Range	Description
Actuator	Diagnosis notices affecting the valve or the pneumatic actuator
Operation	Diagnosis notices with a negative effect on the operation of the positioner
Process	Diagnosis notices that refer to the process and display impairments or states.
Sensor	Alarms indicating problems affecting the reading of the valve position
Electronic	Errors in the device electronics are displayed.
Configuration	Detects if the positioner configuration is missing or faulty

Note

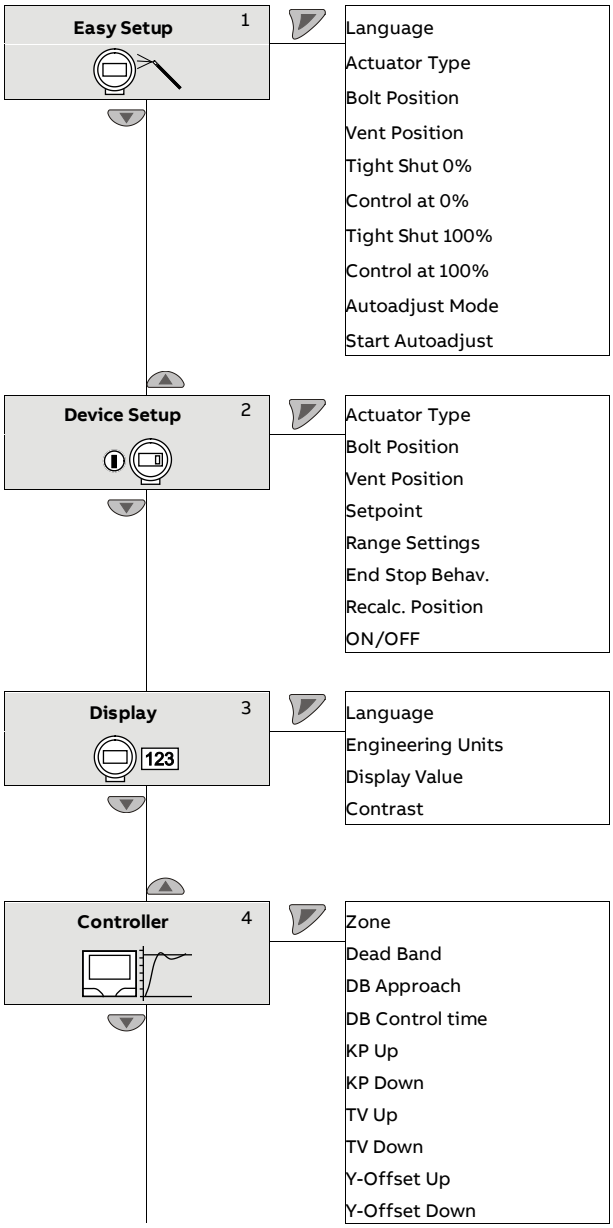
For a detailed description of errors and troubleshooting instructions, please see **Diagnosis / error messages** on page 84.

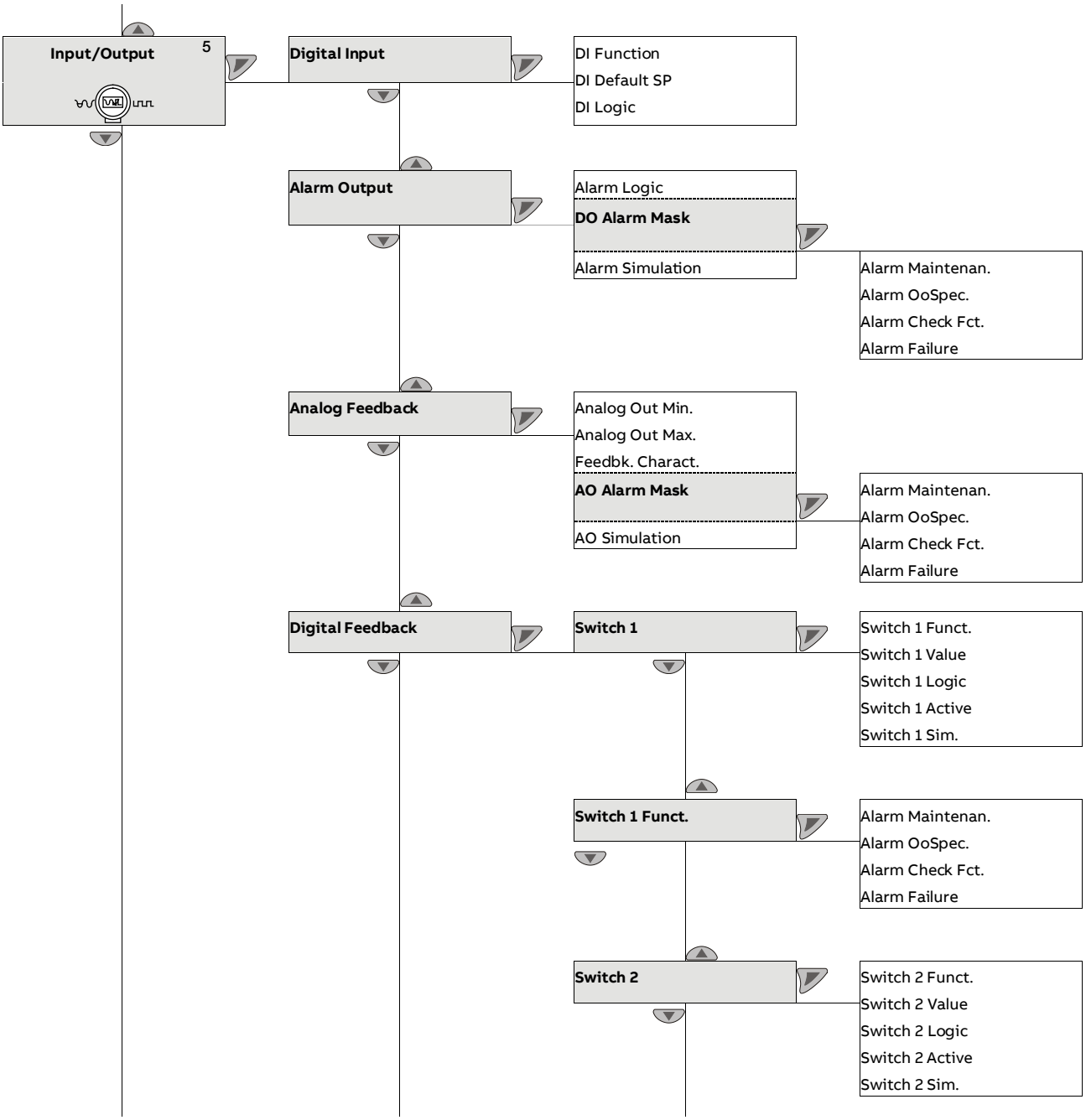
… 12 Operation

Overview of parameters on the configuration level

Note

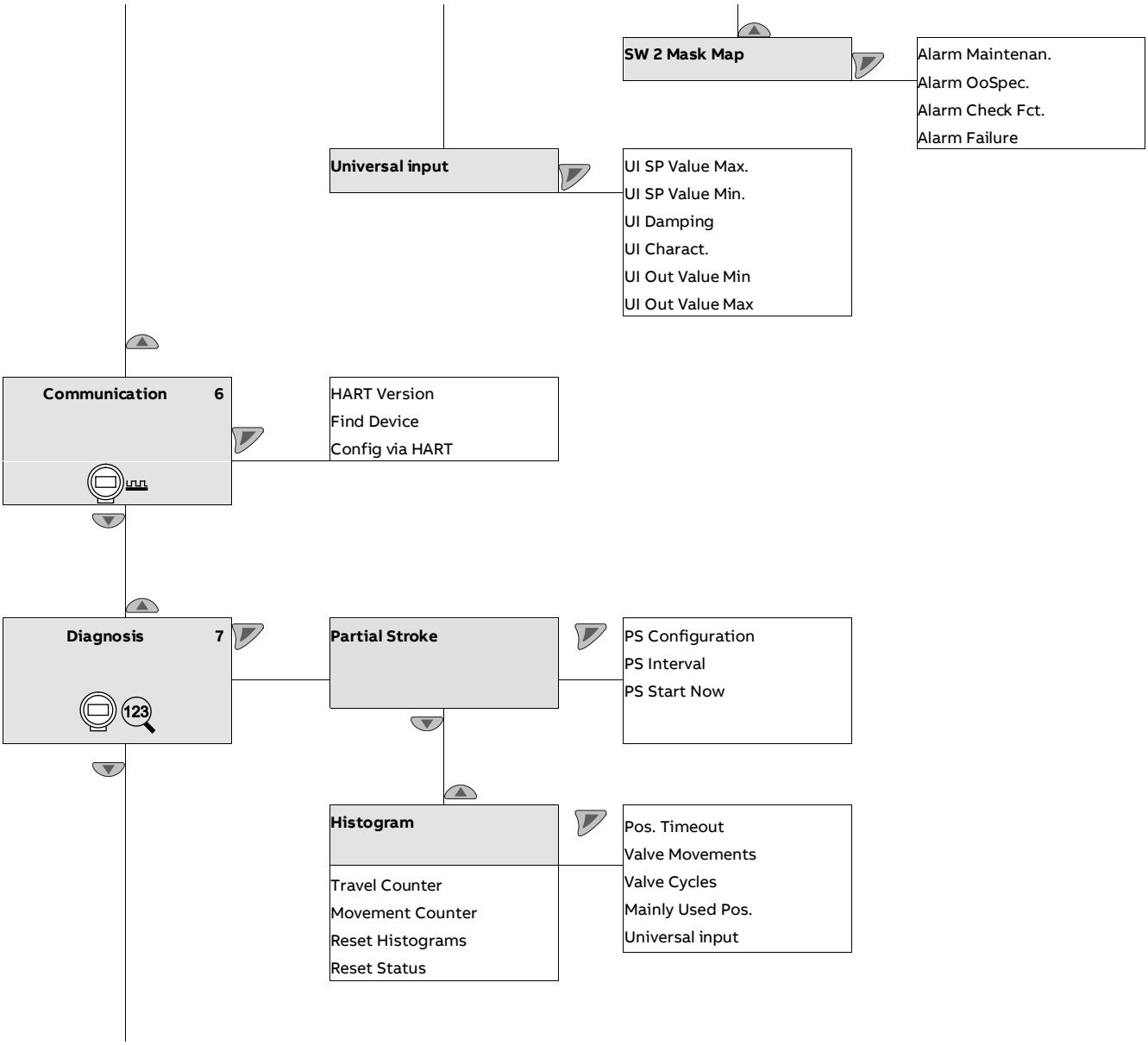
This overview of parameters shows all the menus and parameters available on the device. Depending on the version and configuration of the device, not all of the menus and parameters may be visible in it.

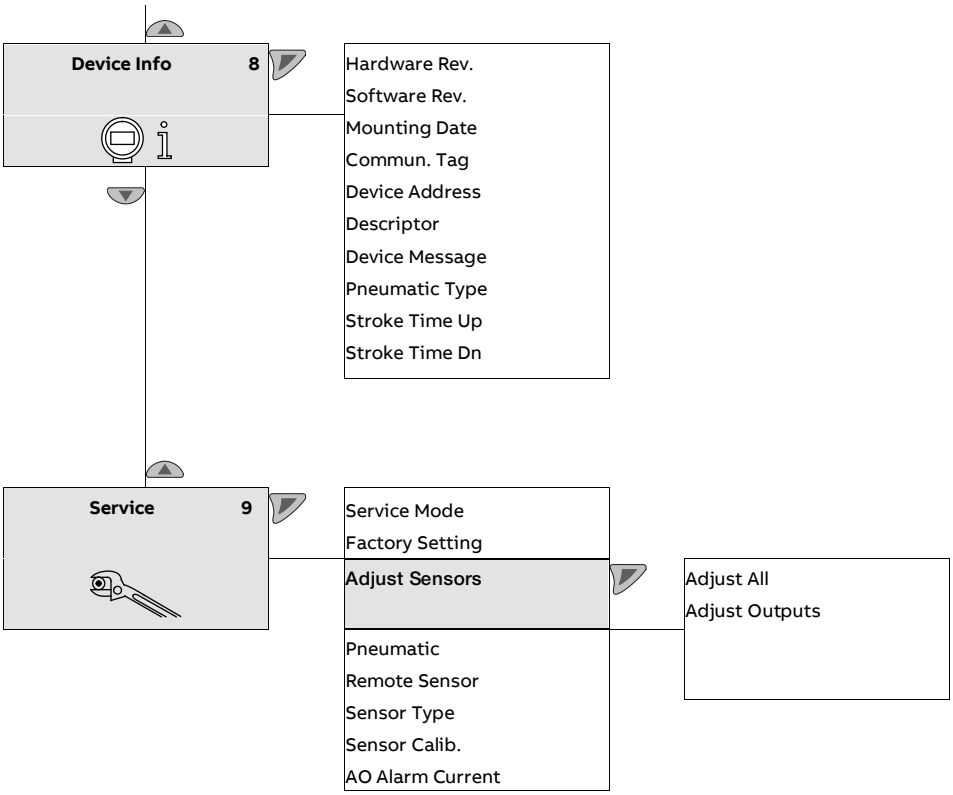



Input/Output
5
Digital Input
DI Function
DI Default SP
DI Logic
Alarm Output
Alarm Logic
DO Alarm Mask
Alarm Simulation
Alarm Maintenan.
Alarm OoSpec.
Alarm Check Fct.
Alarm Failure
Analog Feedback
Analog Out Min.
Analog Out Max.
Feedbk. Charact.
AO Alarm Mask
AO Simulation
Alarm Maintenan.
Alarm OoSpec.
Alarm Check Fct.
Alarm Failure
Digital Feedback
Switch 1
Switch 1 Funct.
Switch 1 Value
Switch 1 Logic
Switch 1 Active
Switch 1 Sim.
Switch 1 Funct.
Alarm Maintenan.
Alarm OoSpec.
Alarm Check Fct.
Alarm Failure
Switch 2
Switch 2 Funct.
Switch 2 Value
Switch 2 Logic
Switch 2 Active
Switch 2 Sim.

… 12 Operation

… Overview of parameters on the configuration level




Device Info 8
Hardware Rev.
Software Rev.
Mounting Date
Commun. Tag
Device Address
Descriptor
Device Message
Pneumatic Type
Stroke Time Up
Stroke Time Dn
Service 9
Service Mode
Factory Setting
Adjust Sensors
Adjust All
Adjust Outputs
Pneumatic
Remote Sensor
Sensor Type
Sensor Calib.
AO Alarm Current

… 12 Operation

Parameter descriptions

Menu Easy Setup

Menu / parameter	Value range	Description
Easy Setup		
Language	English, Deutsch, Français, Italiano, Español, Português	Selects the menu language
Actuator Type	Linear, Rotary	Use this parameter to configure the positioner for operation on a linear actuator (sensor range ±30°) or on a rotary actuator (sensor range ±45°). No mechanical modifications to the positioner are required. **Note** After changing the actuator type, it is recommended that you run Auto Adjust to prevent linearity errors.
Bolt Position	Bolt On Lever, Bolt On Stem	For the linearization, when attaching to linear actuators, a differentiation is made concerning the mechanical part of the position transfer to which the bolt is permanently mounted. • Bolt On Lever (actuator bolt on the potentiometer lever) • Bolt On Stem (actuator bolt on the valve stem) Factory setting: Bolt On Lever
Vent Position	Position 0%, Position 100%	Use this parameter to specify which position is to be shown in the display when output 1 of the positioner is completely vented.
Tight Shut 0%	0.0 to 45.0	The shut-off value is a percentage of the working range from which the 0 % position is approached. Once the specified position limit value is reached, the actuator moves into the 0% end position.
Control at 0%	On, Off	Use this parameter to set the end position behavior. If the parameter is activated, the 0 % position is controlled. Otherwise, the actuator moves into the 0 % mechanical end position.
Tight Shut 100%	55.0 to 100.0	The shut-off value is a percentage of the working range from which the 100 % position is approached. Once the specified position limit value is reached, the actuator moves into the 100 % end position.
Control at 100%	On, Off	Use this parameter to set the end position behavior. If the parameter is activated, the 100 % position is controlled. Otherwise, the actuator moves into the 100 % mechanical end position.
DB Approach	Fast, Medium, Slow	This parameter specifies the speed at which the dead band is approached. In rare cases, overshooting can occur when the valve position is being compensated. This can be prevented by reducing the speed of the dead-band approach (DB approach).
Dead Band Calc.	Active, inactive	Use this function to activate / deactivate the control behavior on the dead band.

Menu / parameter	Value range	Description
Easy Setup (continued)		
Autoadjust Mode	Full, Controller, Valve Range, Zero, Locked	Use this parameter to define the mode or scope of the Auto Adjust function. • Full: Complete automatic adjustment • Controller: Determine control parameters only • Zero: Determine the 0 % position only • Valve Range: Determine stops only • Locked: Automatic adjustment blocked **Note** On valves where slip-stick effect is significant, valve vibration can be reduced by increasing the value of the 'Zone' parameter.
Start Autoadjust	Start	The following values are determined during Auto Adjust: • Direction of action of the actuator • Direction of action of the reset spring • Actuator travel of the actuator / final control element • Stroke time for both directions • Control parameters • Offset for the I/P module • Static friction of the actuator / final control element • Dynamic friction of the actuator / final control element

… 12 Operation

… Parameter descriptions

Menu Device Setup

Menu / parameter	Value range	Description
Device Setup		
Actuator Type	Linear, Rotary	Use this parameter to configure the configuration-, parameterization instruction for the positioner for operation on a linear actuator (sensor range ±30°) or on a rotary actuator (sensor range ±45°). No mechanical modifications to the positioner are required. Linearization can be selected under the 'Linear' parameter in accordance with the mounting conditions: **Note** After changing the actuator type, it is recommended that you run Auto Adjust to prevent linearity errors.
Bolt Position	Bolt On Lever, Bolt On Stem	For the linearization, when attaching to linear actuators, a differentiation is made concerning the mechanical part of the position transfer to which the actuator bolt is permanently mounted. • Bolt On Lever (actuator bolt on the potentiometer lever) • Bolt On Stem (actuator bolt on the valve stem) Factory setting: Bolt On Lever
Vent Position	Position 0%, Position 100%	Use this parameter to specify which position is to be shown in the display when output 1 of the positioner is completely vented.
Setpoint	SP Range Min. SP Range Max. SP Filter SP Ramp Up SP Ramp Down SP Charact. Curve SP Direction	The parameters for the set point are set in this parameter group.
Range Settings	Valve Rng Calib. Upper Valve Rng Lower Valve Rng	In this parameter group, the valve end positions and the work range in which the valve should be regulated, are set. **Note** If the work area is limited, the switching points of the digital feedback opposite the valve area which had possibly been previously adjusted will shift.
End Stop Behav.	Tight Shut 0% Control at 0% Dead Angle 0% Tight Shut 100% Control at 100% Dead Angle 100%	The end position behavior is set in this parameter group.
Recalc. Position	Off, On	Use this parameter to define whether the position indicator and analog position feedback display the valve position (Direct) or the valve flow (Recalculated).
ON/OFF	On/Off	An ON_OFF function mode should process the set point. Default value is FALSE. The set point ramp plus the switch-off function appear for the ON / OFF function. In addition, control mode can be activated / deactivated in the switch-off function, i.e. the valve can either be controlled in the opening / closing end position, or not.

Setpoint

Menu / parameter	Value range	Description
Device Setup / Setpoint		
SP Range Min.	4.0 to 18.4 mA	The setpoint range is the range of the input current as a percentage of the operating range of the fittings from 0 to 100 %. Use parameter '0' to specify the **lower** limit for the setpoint range. **Note** The configured setpoint range must not be smaller than 20 % (3.2 mA).
SP Range Max.	5.6 to 20.0 mA	The setpoint range is the range of the input current as a percentage of the operating range of the fittings from 0 to 100 %. Use parameter '100' to specify the **upper** limit for the setpoint range. **Note** The configured setpoint range must not be smaller than 20 % (3.2 mA).
SP Filter	0 to 120 seconds	Use this parameter to set a damping value for the setpoint signal.
SP Ramp Up	Off up to 0 to 200 seconds	Here the stroke time for the actuator can be increased. A setpoint change is not directly transferred to the positioner; instead, the speed is reduced accordingly. **⚠ CAUTION** **Danger of crushing!** In manual mode, with an active safety position and after errors, the 'Set point ramp' function is disabled. The actuator will therefore move without delay. • Do not reach into the adjustment mechanism.
SP Ramp Down	Off up to 0 to 200 seconds	Here the stroke time for the actuator can be increased. A setpoint change is not directly transferred to the positioner; instead, the speed is reduced accordingly. **⚠ CAUTION** **Danger of crushing!** In manual mode, with an active safety position and after errors, the 'Set point ramp' function is disabled. The actuator will therefore move without delay. • Do not reach into the adjustment mechanism.

… 12 Operation

… Parameter descriptions

Menu / parameter	Value range	Description
Device Setup / Setpoint (continued)		
SP Charact. Curve	Linear 1:25 AM 1:50 AM 25:1 50:1 Custom	Use this parameter to select a function that adjusts the behavior of the positioner to the analog input signal in accordance with a predefined course. This linearizes the characteristic curves for the valves and fittings and improves the behavior of the overall control loop. In addition to five predefined characteristic curves, you can also select a user-configurable characteristic curve, which can only be generated and saved in the device via a PC with the appropriate configuration program (and not locally). **Note** If the 'SP Charact. Curve' parameter is changed, any switching points for digital position feedback which may have been set previously will shift in relation to the valve range.
SP Direction	Direct Reverse	The action describes the relationship between the analog set point and pneumatic output 1. • Direct: Rising, set point 0 to 100 % -> output 0 to 100 % • Reverse: Falling, set point 0 to 100 % -> output 100 to 0 %

Menu: Range Settings

Menu / parameter	Value range	Description
Device Setup / Range Settings		
Valve Rng Calib.		
Upper Valve Rng	0.0 to 100.0 %	Normally, the valve range is determined automatically during Auto Adjust. A partial run of Auto Adjust that is limited to the control parameters or valves and fittings without end stops, however, requires manual adjustment of the valve range. **⚠ CAUTION** **Danger of crushing!** Following manual adjustment of the end positions, it is essential that the parameter 'Control at 100%' is set to 'On'. Otherwise, the valves and fittings may be driven at full speed to an end position. • Do not reach into the adjustment mechanism. **Note** If after automatic adjustment, the valve range is manually rotated (old min. = new max. => old max. = new min.) the device no longer reacts to set point changes. A constant process value of 128 flashes on the display.
Lower Valve Rng	0.0 to 100.0 %	Normally, the valve range is determined automatically during Auto Adjust. A partial run of Auto Adjust that is limited to the control parameters or valves and fittings without end stops, however, requires manual adjustment of the valve range. **⚠ CAUTION** **Danger of crushing!** Following manual adjustment of the end positions, it is essential that the parameter 'Control at 100%' is set to 'On'. Otherwise, the valves and fittings may be driven at full speed to an end position. • Do not reach into the adjustment mechanism. **Note** If after automatic adjustment, the valve range is manually rotated (old min. = new max. => old max. = new min.) the device no longer reacts to set point changes. A constant process value of 128 flashes on the display.

… 12 Operation

… Parameter descriptions

Menu / parameter	Value range	Description
Device Setup / Range Settings (continued)		
Upper Working Rng	0.0 to 100.0 %	The working range can be configured to be smaller than the maximum mechanical working range. The set point range always refers to the configured working range. Use this parameter to specify the **lower** limit of the working range. **⚠ CAUTION** **Danger of crushing!** This function is only active in control mode. In the event of a power supply failure (electric or pneumatic), and in manual mode, the mechanical end positions are approached. • Do not reach into the adjustment mechanism.
Lower Working Rng	0.0 to 100.0 %	The working range can be configured to be smaller than the maximum mechanical working range. The set point range always refers to the configured working range. Use this parameter to specify the **upper** limit of the working range. **⚠ CAUTION** **Danger of crushing!** This function is only active in control mode. In the event of a power supply failure (electric or pneumatic), and in manual mode, the mechanical end positions are approached. • Do not reach into the adjustment mechanism.

End Stop Behav.

Menu / parameter	Value range	Description
Device Setup / End Stop Behav.		
Tight Shut 0%	0 to 45.0	The shut-off value is a percentage of the working range from which the 0 % position is approached. Once the specified position limit value is reached, the actuator moves into the 0% end position.
Control at 0%	On, Off	Use this parameter to set the end position behavior. If the parameter is activated, the 0 % position is controlled. Otherwise, the actuator moves into the 0 % mechanical end position.
Dead Angle 0%	0.0 to 45.0 %	Use this parameter to cut off the unusable range of the valve flow characteristic curve from the point of view of control. The dead angle is a percentage of the working range to which the valve is moved if the input signal is 4.16 mA. **Note** If the parameter is changed, the switching points of the binary feedback opposite the valve area which had possibly been previously adjusted will shift.
Tight Shut 100%	55.0 to 100	The shut-off value is a percentage of the working range from which the 100 % position is approached. Once the specified position limit value is reached, the actuator moves into the 100 % end position.
Control at 100%	On, Off	Use this parameter to set the end position behavior. If the parameter is activated, the 100% position is controlled. Otherwise, the actuator moves into the 100% mechanical end position.
Dead Angle 100%	55.0 to 100.0 %	Use this parameter to cut off the unusable range of the valve flow characteristic curve from the point of view of control. The dead angle is a percentage of the working range to which the valve is moved if the input signal is 19.84 mA. **Note** If the parameter is changed, the switching points of the binary feedback opposite the valve area which had possibly been previously adjusted will shift.

… 12 Operation

… Parameter descriptions

Menu: Display

Menu / parameter	Value range	Description
Display		
Language	English, Deutsch, Français, Italiano, Español, Português	Selects the menu language
Engineering Units	Temperature Pressure Universal input	Use this parameter to select the units to be displayed. • Temperature: °C – degrees Celsius °F – degrees Fahrenheit °R – degrees Rankine K – Kelvin • Pressure: psi bar kPa Mpa • Universal input: The unit can only be entered in plain text using a DTM / EDD.
Display Value	Position % Position ° Setpoint % Setpoint mA Deviation % Temperature Univ. Inp. Press. Y1 Press. Y2 Diff. Press. Supply Press.	Use this parameter to select which value is to be shown on the process display. • Position % – Position in % • Position ° – Position in degrees • Setpoint % – Set point in % • Setpoint mA – Set point in mA • Deviation % – Control deviation in % • Temperature – Device temperature • Univ. IN – Scaled value at universal input • Press. Y1 – Pressure output 1 • Press. Y2 – Pressure output 2 • Diff. Press. – Differential pressure between the outputs • Supply Press. – Supply air pressure
Contrast	0 to 100 %	Display contrast

Menu: Controller

Menu / parameter	Value range	Description
Controller		
Zone	1 to 100 in steps of 1	This parameter specifies the point at which the control structure is switched over when the dead band is being approached. **Note** On valves where slip-stick effect is significant, valve vibration can be reduced by increasing the value of the 'Zone' parameter.
Dead Band	0.10 to 10.00 % in steps of 0.01 %	The dead band defines a +/− range around the position set point. Once the valves and fittings reach this range, the positioner maintains this position.
Dead Band Calc.	Active, inactive	Use this function to activate / deactivate the control behavior on the dead band.
DB Approach	Fast Medium Slow	This parameter specifies the speed at which the dead band is approached. In rare cases, overshooting can occur when the valve position is being compensated. This can be prevented by reducing the speed of the dead band approach (DB Approach).
DB Control time	0 to 30 s	In some cases it can happen that the valve continues moving slowly after reaching the dead band and leaves the dead band again. To prevent this, this parameter can be used to specify how long the controller should be active after reaching the dead band. Factory setting: 0 s
DB Close-Up Range	0 to 1000 s.	Use this parameter to enter a monitoring time up to the point at which the dead band is reached. When the dead band is exceeded, the monitoring time is started. If the dead band around the new position set point is not reached again within the specified time, an alarm is triggered. Once the set point has been reached, the alarm is automatically reset. **Note** • With active shutoff there is no alarm message. Once the set point has been reached, the alarm is automatically reset. • The monitoring stroke time is determined during automatic adjustment. Selecting a value of '0 s' deactivates this parameter.

… 12 Operation

… Parameter descriptions

Menu / parameter	Value range	Description
Controller (continued)		
KP Up	1.0 to 400.0	Use this parameter to adjust the KP value for the **up** positioning direction (towards 100 %). The KP value is the gain of the controller. The control speed and stability are influenced by the KP value. With higher KP values, the control speed increases. To compensate for existing dissymmetries in the controlled system, the KP value should be set separately for both positioning directions (up / down). For most actuators, satisfactory control behavior is achieved with a KP value between 2.0 and 10.0. **Note** The control precision is not affected by the KP value.
KP Down	1.0 to 400.0	Use this parameter to adjust the KP value for the **down** positioning direction (towards 0 %). The KP value is the gain of the controller. The control speed and stability are influenced by the KP value. With higher KP values, the control speed increases. To compensate for existing dissymmetries in the controlled system, the KP value should be set separately for both positioning directions (up / down). For most actuators, satisfactory control behavior is achieved with a KP value between 2.0 and 10.0. **Note** The control precision is not affected by the KP value.
TV Up	10 to 800 ms	Use this parameter to adjust the KP value for the **up** positioning direction (towards 100 %). The TV value is the derivative time of the controller. The control speed and stability are affected by the TV value in such a way that it counteracts the KP value dynamically. The control speed decreases as the TV value increases. To compensate for existing dissymmetries in the controlled system, the TV value should be configured separately for both positioning directions (up / down).
TV Down	10 to 800 ms	Use this parameter to adjust the TV value for the **down** positioning direction (towards 0 %). The TV value is the derivative time of the controller. The control speed and stability are affected by the TV value in such a way that it counteracts the KP value dynamically. The control speed decreases as the TV value increases. To compensate for existing dissymmetries in the controlled system, the TV value should be configured separately for both positioning directions (up / down).

Menu / parameter	Value range	Description
Controller (continued)		
Y-Offset Up	1 to 100.0 %	Use this parameter to adjust the Y offset for the **up** positioning direction (towards 100 %). The 'offset for the set point signal' linearizes the behavior of the I/P module used and enables rapid compensation even in the case of small control deviations. The value is limited at the lower end by a minimum value (measuring range lower limit). The offset significantly affects the control speed for control deviations of less than 5 %. To compensate for existing dissymmetries in the controlled system, the offset should be configured separately for both positioning directions (up / down). For most actuators, satisfactory control behavior is achieved with offset values between 40 and 80 %. If, in the event of set point changes, the control behavior demonstrates an overshoot of less than 2 %, both offset values should be decreased. Both offset values should be increased when the actuator stops outside the dead band.
Y-Offset Down	1 to 100.0 %	Use this parameter to adjust the Y offset for the **down** positioning direction (towards 0 %). The 'offset for the set point signal' linearizes the behavior of the I/P module used and enables rapid compensation even in the case of small control deviations. The value is limited at the lower end by a minimum value (neutral zone). The offset significantly affects the control speed for control deviations of less than 5 %. To compensate for existing dissymmetries in the controlled system, the offset should be configured separately for both positioning directions (up / down). For most actuators, satisfactory control behavior is achieved with offset values between 40 ... 80 %. If, in the event of set point changes, the control behavior demonstrates an overshoot of less than 2 %, both offset values should be decreased. Both offset values should be increased when the actuator stops outside the dead band.

Note

In the case of most actuators, all control parameters can be optimized by using Auto Adjust. The parameters should only be changed if Auto Adjust cannot be executed or does not result in satisfactory control behavior.

… 12 Operation

… Parameter descriptions

Menu: Input/Output

Menu / parameter	Value range	Description
Input/Output		
Digital Input	DI Function DI Default SP DI Logic	Selection of functions or states that are executed or adopted if the 'digital input' has been activated.
Alarm Output	Alarm Logic DO Alarm Mask Alarm Simulation	Use this parameter to configure the alarm output via which a general alarm can be issued. Depending on the activated Namur classification group, it is also possible for the general alarm to be issued as an alarm current.
Analog Feedback	Analog Out Min. Analog Out Max. Feedbk. Charact. AO Alarm Mask AO Simulation	The current valve position (or when the 'backward-calculated characteristics of the valve influence') is reported back as a current signal via the analog feedback message. Depending on the activated Namur classification group, it is also possible for the general alarm to be issued as an alarm current.
Digital Feedback	Switch 1 SW 1 Mask Map Switch 2 SW 2 Mask Map	Binary feedback can be used to configure two limit switches which are able to report when a value is reached or exceeded, via a current signal. Additionally, diagnostics bits can be output via the second switch.
Universal input	UI SP Value Max. UI SP Value Min. UI Damping UI Charact. UI Out Value Max UI Out Value Min	Use this menu item to configure and simulate the universal input.

Menu: Digital Input

Menu / parameter	Value range	Description
Input/Output / Digital Input		
DI Function	Off	• Off – No function
	Hold Last SP	• Hold Last SP – Last set point is retained
	Hold User SP	• Hold User SP – Substitute value for set point (defined in 'DI Default Setup.')
	Hold Last Pos.	• Hold Last Pos. – Hold previous position
	Vent. Out1	• Vent. Out1 – Vent Output 1
	Vent. Out2	• Vent. Out2 – Vent Output 2
	Freeze Outputs	• Freeze Outputs – Close pneumatic outputs
	Partial Stroke Test	• Partial Stroke Test – Start Partial Stroke Test
	Service Required	• Service Required – Issue diagnosis bit via binary feedback
	Safety Position	• Safety Position – Approach safety position
	Conf. Locked	• Conf. Locked – Block local configuration
	Panel Locked	• Panel Locked – Block local operation
	Locked	• Locked – Block all operation and setting options.
DI Default SP	0 to 100%	The position defined using this parameter is approached when the 'Digital Input' function has been set to 'Hold User SP' and the digital input has been activated.
DI Logic	Active High, Active Low	Use this parameter to configure the contact logic for activating the digital input. **Note** For the following parameters, the contact logic is always 'Active Low' or 'Off': • Safety Position • Conf. Locked • Panel Locked • Locked

… 12 Operation

… Parameter descriptions

Menu: Alarm Output

Menu / parameter	Value range	Description
Input/Output / Alarm Output		
Alarm Logic	Active High, Active Low	Use this parameter to define the contact logic for the alarm output. • Active High –> I > 2.1 mA • Active Low –> I < 1.2 mA
DO Alarm Mask	Alarm Maintenan., Alarm OoSpec., Alarm Check Fct., Alarm Failure	Use this parameter to select which general alarms are output as an alarm current, depending on the activated Namur classification group. • Alarm Maintenan. – Maintenance needed • Alarm OoSpec. – Operation outside specifications • Alarm Check Fct. – Functional test needed • Alarm Failure – Errors
Alarm Simulation	Off, Low, High	The presence of an alarm can be simulated here in order to output the alarm current.

Menu: Analog Feedback

Menu / parameter	Value range	Description
Input/Output / Analog Feedback		
Analog Out Min.	4.0 to 18.4 mA	Use this parameter to specify the lower current range limit for the analog feedback. The current range corresponds to the configured stroke range. **Note** The current range limits can be freely configured between 4 and 18.5 mA. However, the current range must not be smaller than 10 % (1.6 mA).
Analog Out Max.	5.6 to 20.0 mA	Use this parameter to specify the upper current range limit for the analog feedback. The current range corresponds to the configured stroke range. **Note** The current range limits can be freely configured between 4 and 20 mA. However, the current range must not be smaller than 10 % (1.6 mA).
Feedbk. Charact.	Direct, Reverse	Use this parameter to specify the characteristic curve for the analog feedback. • Direct (rising) = Position 0 to 100 % = Signal 4 to 20 mA • Reverse (falling) = Position 0 to 100 % = Signal 20 to 4 mA
AO Alarm Mask	Alarm Maintenan. Alarm OoSpec. Alarm Check Fct. Alarm Failure	When a general alarm is issued, an alarm current can be sent via the analog position feedback. These alarm groups are defined in accordance with Namur NE107. A high alarm current (‘High’ i >21 mA), low alarm current (‘Low’ I < 3.6 mA, or ‘Off’ can be set for each individual group.
AO Simulation	Off Low High Input current HW Alarm Current	The analog position feedback function is simulated in this parameter group. • Off – Terminate simulation. • Reverse – Alarm current I < 3.6 mA • High – Alarm current I > 21 mA • Input current – The input current of the positioner is output. • HW Alarm Current – The ‘AO Alarm Current’ set in ‘Service Mode’ is output.

Menu: Digital Feedback

Menu / parameter	Value range	Description
Input/Output / Digital Feedback		
Switch 1	Switch 1 Funct. Switch 1 Value Switch 1 Logic Switch 1 Active	The function of switch 1 is configured in this parameter group. • Switch 1 Funct. – Switch 1 function • Switch 1 Value – Switch 1 value • Switch 1 Logic – Switch 1 logic • Switch 1 Active – Switch 1 activation.
SW 1 Mask Map	Alarm Maintenan. Alarm OoSpec. Alarm Check Fct. Alarm Failure Switch 1 Sim.	The function of switch 1 MASK MAP' is configured in this parameter group. • SW 1 Mask Map – Switch 1 diagnosis classification • Switch 1 Sim. – Switch 1 simulation
Switch 2	Switch 1 Funct. Switch 1 Value Switch 1 Logic Switch 1 Active	The function of switch 2 is configured in this parameter group. • Switch 2 Funct. – Switch 2 function • Switch 2 Value – Switch 2 value • Switch 2 Logic – Switch 2 logic • Switch 2 Active – Switch 2 activation. • SW 2 Mask Map – Switch 2 diagnosis classification • Switch 2 Sim. – Switch 2 simulation
SW 2 Mask Map	Alarm Maintenan. Alarm OoSpec. Alarm Check Fct. Alarm Failure Switch 2 Sim.	The function of switch '2 MASK MAP' is configured in this parameter group. • SW 2 Mask Map – Switch 2 diagnosis classification • Switch 2 Sim. – Switch 2 simulation

Menu: Switch 1

Menu / parameter	Value range	Description
Input/Output / Digit. Feedback / Switch 1		
Switch 1 Funct.	Position Info Diagnostic State	Use this parameter to select whether the switch is to be used as a limit signal generator or for signaling diagnostics messages. • Position Info – Evaluate position • Diagnostic State – Assess diagnosis status
Switch 1 Value	0 to 100%	Use this parameter to configure the position value as a limit signal generator. It is taken into account when the 'Switch 1 Funct.' parameter is set to 'Position Info'.
Switch 1 Logic	Active High Active Low	Use this parameter to select the contact logic. • Active High (active) = Output current I > 2.1 mA • Active Low (active) = Output current I < 1.2 mA
Switch 1 Active	Fall below, Exceeding	Use this parameter to select the edge for activating the switch. • Off – Deactivated • Fall below – If down-scaled • Exceeding – If up-scaled

… 12 Operation

… Parameter descriptions

Menu: SW 1 Mask Map

Menu / parameter	Value range	Description
Input/Output / Digital Feedback / SW 1 Mask Map		
Alarm Maintenan.	On, Off	When a general alarm is issued, an alarm current can be sent via the analog position feedback. These alarm groups are defined in accordance with Namur NE107. Each individual group can be activated. • Alarm Maintenan. – Maintenance needed • Alarm OoSpec. – Operation outside specifications • Alarm Check Fct. – Functional test needed • Alarm Failure – Errors
Alarm OoSpec.		
Alarm Check Fct.		
Alarm Failure		
Switch 1 Sim.		Use this parameter to simulate the switch function. • Off –Simulation deactivated

Menu: SW 2 Mask Map

Menu / parameter	Value range	Description
Input/Output / Digital Feedback / SW 2 Mask Map		
Alarm Maintenan.	On, Off	When a general alarm is issued, an alarm current can be sent via the analog position feedback. These alarm groups are defined in accordance with Namur NE107. Each individual group can be activated. • Alarm Maintenan. – Maintenance needed • Alarm OoSpec. – Operation outside specifications • Alarm Check Fct. – Functional test needed • Alarm Failure – Errors
Alarm OoSpec.		
Alarm Check Fct.		
Alarm Failure		
Switch 1 Sim.		Use this parameter to simulate the switch function. • Off –Simulation deactivated

Menu: Switch 2

Menu / parameter	Value range	Description
Input/Output / Digit. Feedback / Switch 2		
Switch 2 Funct.	Position Info Diagnostic State	Use this parameter to select whether the switch is to be used as a limit signal generator or for signaling diagnostics messages. • Position Info – Evaluate position • Diagnostic State – Assess diagnosis status
Switch 2 Value	0 to 100%	Use this parameter to configure the position value as a limit signal generator. It is taken into account when the 'Switch 2 Funct.' parameter is set to 'Position Info'.
Switch 1 Logic	Active High Active Low	Use this parameter to select the contact logic. • Active High (active) = Output current I > 2.1 mA • Active Low (active) = Output current I < 1.2 mA
Switch 1 Active	Fall below, Exceeding	Use this parameter to select the edge for activating the switch. • Off – Deactivated • Fall below – If down-scaled • Exceeding – If up-scaled

Menu: Universal input

Menu / parameter	Value range	Description
Input/Output / Universal input		
UI SP Value Max.	4.0 to 20.0 mA	Use this parameter to specify the upper current range limit for the universal input.
UI SP Value Min.	4.0 to 20.0 mA	Use this parameter to specify the lower current range limit for the universal input.
UI Damping	0 to 60 s	Use this parameter to set a damping value for the universal input signal.
UI Charact.	Linear, Custom	Use this parameter to select a function that adjusts the behavior of the positioner to the analog input signal according to a predefined course. This linearizes the characteristic curves for the valves and fittings and improves the behavior of the overall control loop. • Linear - linear • Custom - configurable by user The user-configurable characteristic curve cannot be generated and saved in the device locally, however; this can only be done via a PC with the appropriate configuration program (DTM / EDD).
UI Out Value Min	0.0 to 30000	Use this parameter to define which value is assigned to the minimum universal input signal 'UI SP Value Min.'.
UI Out Value Max	0.0 to 30000	Use this parameter to define which value is assigned to the maximum universal input signal 'UI SP Value Max.'.

… 12 Operation

… Parameter descriptions

Menu: Communication

Menu / parameter	Value range	Description
Communication		
HART Version	HART 5, HART 7	Use this parameter to define the HART protocol via which the device is to communicate. • HART 5 – HART® Protocol 5.9 • HART 7 – HART® Protocol 7.2 (factory setting) **Note** • If the HART® 7 function 'Write protection (Lock ALL)' has been activated via the DTM / EDD and communication has been switched to HART® 5 on the device, write protection is canceled when the device is restarted. • In the event of a switch from HART® 7 to HART® 5, if write protection has been activated via HART 7, it is deactivated when the device is restarted. • When switching from HART® 5 to HART® 7, device addresses greater than number 15 are set to 0.
Find Device*	Off* Find Once* Find Continuous*	If 'Find Once' is selected, after HART command #73 is received the device responds once with HART command #73, which has the same content as command #0. If 'Find Continuous' is selected - after HART Command #73 is received, the device responds recurrently with HART Command #73, which has the same content as Command #0. Selecting the 'Off' parameter ends the 'Find Device' function.
Config via HART	Off/On	With this parameter, the configuration is switched on / off via HART; technically a write protection is activated for the HART communication. **If activated:** • No limitation to HART and other functions. **If deactivated:** • No HART write command can be written (parameter change, start functions, etc). • Device response with 'HART access limited', if write Cmd is written. • No limitation at read commands. • No limitation for the HMI configuration // unlimited access via HMI - parameter change, functions like 'Auto Adjust Complete', etc. remain possible. • 'HART limited' will be displayed on the HMI main.

* Parameter only visible if HART® 7 has been selected.

Menu: Diagnosis

Menu / parameter	Value range	Description
Diagnosis		
Partial Stroke	PS Configuration, PS Interval, PS Start Now	'Partial Stroke Test' is used to test the mobility of the safety-related valves and fittings. For this purpose, the valve is moved by a configurable amount in the direction of the safety position (venting of positioner output 1). If this does not happen within the expected time, an alarm is signaled. After the test, the valve follows the current set point again. The start of the test is triggered using a time interval 'PS Interval', through the digital input (configuration: Input/Output-> Digital Input-> DI Function -> Partial Stroke) or locally on the device 'PS Start Now'. ***NOTICE*** **Property damage** During the test, the valve no longer follows the set point current. This change in the valve position may have a detrimental effect on the process.
Histogram	Pos. Timeout Valve Movements Valve Cycles Mainly Used Pos. Universal input	Use this parameter to select which histogram is to be displayed. In this menu, the number of values or events is assigned to a valve range and displayed as an individual bar graph. The valve ranges are divided up as follows: < 0 %, 0 – 10 %, 10 – 20 %, 20 – 30 %, 30 – 40 %, 40 – 50 %, 50 – 60%, 60 – 70 %, 70 – 80 %, 80 – 90%, 90 – 100 %, > 100 % The histograms support valve diagnostics and allow conclusions to be drawn about the valve, control quality, wear, and properties of the valves and fittings. Pos. Timeout – Number of 'positioning time too slow' events Valve Movements – Number of valve movements Valve Cycles – Number of valve lifts Mainly Used Pos. – Most used valve position Universal input – Universal input value
Travel Counter	0 to 200,000,000	The 'Travel Counter' is used to determine the positioner travel. The counter adds up the distance traveled as a % of the set 'operating range'. Limit values can be configured for the counter (only via DTM / EDD). If the 'Travel Counter' reaches a limit value, a message is output.
Movement Counter	0 to 200,000,000	The 'Movement Counter' is used to determine the actuator's movements. Any movement that exceeds the defined hysteresis is counted (default setting: 50%). The hysteresis can only be set / changed using a PC (DTM / EDD). Limit values can be configured for the movement counter (only via DTM / EDD). If the counter reaches a limit value, a message is output.
Reset Histograms		Use this parameter to reset the histograms.
Reset Status		Use this parameter to reset the diagnostic status.

… 12 Operation

… Parameter descriptions

Menu: Partial Stroke

Menu / parameter	Value range	Description
Diagnosis / Partial Stroke		
PS Configuration	PS Vent Amount, Timeout Value Dead Time	• PS Vent Amount: Position change in the direction of the safety position (venting of positioner output 1) by which the valve is to be moved. • Timeout Value: If the valve does not reach the new valve position, which has changed by the amount defined by 'PS Vent Amount', within the defined time (Timeout Time), an alarm is issued. The step response from the DTM can be used to determine the partial stroke parameters. **Note** The default setting for this time is automatically determined by Auto Adjust (only in Auto Adjust mode: Valve Ranges, Full). • Dead Time: Use this parameter (dead time) to set the time in which the valve should have moved out of the end position. The dead time must be less than half the 'Timeout Value'. **Note** The partial stroke must be tested after configuration!
PS Interval	0 to 1000 days	Use this parameter to define the time interval according to which the 'Partial Stroke Test' is triggered on a cyclical basis.
PS Start Now	Test Passed Test Failed	Use this parameter to trigger the partial stroke directly. The result is shown on the display: • Test Passed – Test successful • Test Failed – Test failed ***NOTICE*** **Property damage** During the test, the valve no longer follows the set point current. This change in the valve position may have a detrimental effect on the process.

Menu: Device Info

Note

This menu is only used to display the device parameters. The parameters are displayed independently of the configured access level, but cannot be changed.

Menu / parameter	Value range	Description
Device Info		
Hardware Rev.		The hardware revision is displayed here.
Software Rev.		The firmware revision is displayed here.
Mounting Date		The installation date is displayed here. The date can only be entered and changed using a PC (DTM / EDD).
Commun. Tag		The communication name is displayed here. The name can only be entered and changed using a PC (DTM / EDD).
Long Tag*		The long text for the measuring point tag is displayed here.
Device Address		The device address is displayed here.
Descriptor		The measuring point tagging is displayed here. The description can only be entered and changed using a PC (DTM / EDD).
Device Message		The device information is displayed here. The description can only be entered and changed using a PC (DTM / EDD).
Pneumatic Type	Single / Safe Single / Freeze Double / Safe Double / Freeze	The type of pneumatics that the device works with is displayed here. After installing a different type of pneumatics, this type needs to be set in the 'Service -> Pneumatic' menu. • Single / Safe – Single acting, safety position with no current, with venting function • Single / Freeze – Single acting, safety position with no current, with blocking function. • Double / Safe – Double acting, safety position with no current, with venting function. • Double / Freeze – Double acting, safety position with no current, with blocking function.
Stroke Time Up	0 to 200 s	The stroke time determined by Auto Adjust (only Auto Adjust types 'Stroke' and 'Full') for the direction of the 100 % position is displayed here.
Stroke Time Dn	0 to 200 s	The stroke time determined by Auto Adjust (only Auto Adjust types 'Stroke' and 'Full') for the direction of the 0 % position is displayed here.

* Visible only with HART® 7

… 12 Operation

… Parameter descriptions

Menu: Service

Menu / parameter	Value range	Description
Service		
Service Mode	Off, On*	Activate service mode. **⚠ CAUTION** **Danger of crushing!** If Service Mode is set to 'On', the valve moves to its pneumatic safety position. In the case of the 'venting' safety position, the valve moves to the end position in an uncontrolled manner and / or no longer follows the set point current. The actuator will therefore move without delay. • Do not reach into the adjustment mechanism.
Factory Setting*		Load factory settings
Adjust Sensors*	Adjust All, Adjust Outputs	**Note** The supply pressure and the drive must not be pressurized for calibration to atmospheric pressure. Otherwise, the existing pressure is applied as the zero point. In order to set the zero point for the pressure sensors, the pneumatic device connections for the supply air and actuator must be disconnected and vented. The sensors will then be calibrated to the atmospheric pressure. **⚠ CAUTION** **Risk of injury!** For calibration of the outputs, the device triggers a sequence to vent the outputs. The end points of the valve are approached without the brakes being applied. • Do not reach into the adjustment mechanism. Supply Pressure – Supply air pressure Pressure Y1 – Pressure, output 1 Pressure Y2 – Pressure, output 2
Pneumatic*	Single / Safe Single / Freeze Double / Safe Double / Freeze	Use this parameter to adapt the positioner software to the installed I/P module. This is required when installing a different I/P module type. The type of pneumatics that the device works with is displayed here. • Single / Safe – Single acting, safety position with no current, with venting function. • Single / Freeze – Single acting, safety position with no current, with blocking function. • Double / Safe – Double acting, safety position with no current, with venting function. • Double / Freeze – Double acting, safety position with no current, with blocking function. **⚠ CAUTION** **Danger of crushing!** If an incorrect type of pneumatics is selected, the valve may move into an end position in an uncontrolled manner and / or may no longer follow the set point current. The actuator will therefore move without delay. • Do not reach into the adjustment mechanism.

* Parameter is only visible if Service Mode is set to 'On'.

Menu / parameter	Value range	Description
Service (continued)		
Remote Sensor*	Off, On	If an external position sensor is connected, this parameter must be set to 'On'.
Sensor Type*	Standard Non-Contact External Sensor No Linearization	Use this parameter to select the version of the installed position sensor. • Standard – Standard position sensor • Non-Contact – Contactless position sensor.
Sensor Calib.*	Value 1 ... Value 5 Confirm	Once the position sensor has been replaced, the correction values used for linearizing the sensor characteristic curve (supplied by the factory together with the position sensor) can be entered here. The entered values are accepted by using 'Confirm'.
Sensor Position	0° Position	Use this parameter to set the fine adjustment of the 0° position after a sensor replacement. The current position of the sensor range is accepted as a center position by using 'Confirm'. **Note** For this purpose, the positioner feedback shaft must be exactly in the center position.
AO Alarm Current*	Low, High	Use this parameter to set the alarm current for the analog position feedback. This current is output even if the positioner is in a no-current state (external supply). • High – I > 21.5 mA • Low – I < 3.6 mA **Note** In order to save the parameter in the non-volatile memory on the 'analog position feedback' module, the module must be supplied with 24 V during parameterization.

* Parameter is only visible if Service Mode is set to 'On'.

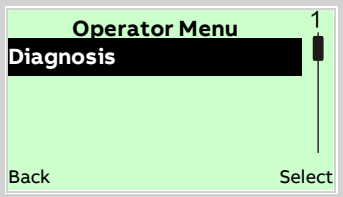
13 Diagnosis / error messages

Calling up the error description

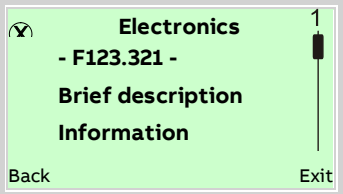
Additional details about the error that has occurred can be called up on the information level.



1. Use to switch to the information level (Operator Menu).



2. Use / to select the submenu ‘Diagnosis’.
3. Confirm the selection with .



The error message is shown on the display according to priority.
The first line shows the area in which the error has occurred.
The second line shows the unique error number. It is made up of the priority (Fxxx) and the error position (.xxx)
The next lines show a brief description of the error and information on how to remedy it.
You absolutely need to scroll the display further to read the error message in more detail.

Note
For a detailed description of the error messages and information on troubleshooting, see the following pages.

Possible error messages

No.	Priority	Fault message	Possible cause	Troubleshooting the Instrument	F	C	S	M	Group
0	90	Position measurement Failure*	Defective position sensor	Replace position sensor	X				Sensor
1	91	Valve blocked	Friction too high	Valve requires maintenance	X				Actuator
2	50	Positioning timeout - Check valve maintenance	Positioning time up-scaled friction high	Valve requires maintenance				X	Actuator
3	51	Positioning unstable	Change disturbance variables	Select 'Adaptive Control' mode				X	Configuration
4	49	Position out of travel range	Mounting kit is bent	Check mounting conditions				X	Process
5	52	Zero-Point displacement	Valve seat is damaged	Valve requires maintenance				X	Process
6	43	kp up exceeded	Friction too high	Valve requires maintenance				X	
7	44	kp Down exceeded	Friction too high	Valve requires maintenance				X	
8	92	Setpoint failure electronics	Faulty electronics	Replace electronics	X				Electronics
9	70	Setpoint out of range	Defective DCS card	Replace DCS card			X		Operation
10	80	Device not calibrated	Auto adjust has not yet been executed	Execute auto adjust		X			Configuration
11	79	Controller inactive	Test function activated	Test function deactivated		X			
12	53	Stroke counter limit exceeded	Many valve strokes	Valve requires maintenance				X	
13	54	Travel counter limit exceeded	Many valve strokes or vibrating valve	Valve requires maintenance				X	
14	55	Electronic temperature measurement failure	Temperature sensor defective	Replace electronics				X	Electronics
15	71	Electronic temperature out of limits	Temperature is too high or too low	Check mounting conditions			X		Operation
16	94	Configuration data failure	Output piping mixed up	Check mounting conditions		X			Actuator
17	95	Electronics - NV chip defect	Faulty electronics	Replace electronics	X				Electronics
18	96	Non volatile data defect	Faulty electronics	Replace electronics	X				Electronics
19	56	Leakage during operation	Leakage in actuator, piping, connections, or positioner	Start leakage test				X	Actuator
20	57	Leakage chamber 1	Leakage in chamber 1 of the actuator or pneumatics output line 1	Check chamber 1 of the actuator or pneumatics output line 1				X	Actuator
21	58	Leakage chamber 2	Leakage in chamber 2 of the actuator or pneumatics output line 2	Check chamber 2 of the actuator or pneumatics output line 2				X	Actuator

* If the 'positioning timeout' alarm has been set, the positioner monitors if the position changes more than 0.1 % over 5 seconds. If not, a 'Valve Blocked' diagnosis notice is output. No alarm is output in the end position.

… 13 Diagnosis / error messages

… Possible error messages

No.	Priority	Fault message	Possible cause	Troubleshooting the Instrument	F	C	S	M	Group
22	59	Leakage in actuator	Leakage inside the actuator	Check the actuator diaphragms				X	Actuator
23	78	Pressure NV Data defect		Restart device				X	Electronics
24	83	Pressure NV chip defect		Replace pressure option				X	Electronics
25	73	Overpressure from supply	Supply air pressure too high	Check supply air pressure			X		Operation
26	74	Overpressure from supply	Supply air pressure is too low or filter is clogged	Check supply air pressure or filter			X		Operation
27	75	Supply pressure limit high exceeded	Supply air pressure too high	Check supply air pressure			X		Operation
28	76	Pressure hammer from supply	Pressure shock in compressed air supply Supply air pressure too high	Check air supply			X		
29	40	tv up exceeded	Excessive dynamic friction	Valve requires maintenance				X	Actuator
30	45	tv down exceeded	Excessive friction	Valve requires maintenance				X	Actuator
31	41	Y-Offset Up exceeded	Excessive dynamic friction	Valve requires maintenance				X	Actuator
32	42	Y-Offset Down exceeded	Excessive friction	Valve requires maintenance				X	Actuator
33	61	Friction limit exceeded	Excessive dynamic friction	Valve requires maintenance				X	Actuator
34	62	Stiction limit exceeded	Excessive friction	Valve requires maintenance				X	Actuator
35	77	Universal input out of range	Input range area up-scaled	Check parameterization			X		
36	63	Partial stroke failed	The partial stroke test has failed	Check valve.				X	
37	64	Option module defect	Defective option module	Replace option module				X	Electronics
38	65	Universal input limit exceeded	Universal input limit value up-scaled	Depends on application				X	Actuator
39	47	Analog output simulation active	Analog feedback monitor simulation active	Terminate simulation.		X			
40	46	Binary output simulation active	Alarm current binary output simulation active	Terminate simulation.		X			
41	97	Fail safe active - via device error	Positioner in safety position due to device failure	Check next error message, determine and eliminate cause.	X				
42	66	Fail safe active - via user	Positioner in safety position due to user action	Switch off service mode		X			Operation

No.	Priority	Fault message	Possible cause	Troubleshooting the Instrument	F	C	S	M	Group
43	67	Binary input active	Digital input activated by the user	Deactivate the digital input		X			Operation
44	68	Switchpoint 1 exceeded	Valve has passed limit 1 position	Depends on application		X			Process
45	69	Switchpoint 2 exceeded	Valve has passed limit 2 position	Depends on application		X			Process
46	82	Analog output supply fault	No power supply on analog output	Check the supply power				X	Operation
47	81	Pressure measurement defect	'Print option' optional module defective	Replace 'Print option' optional module				X	Electronics
202		Extern access	Communication with the device is performed via HART	Depends on application		X			Configuration
203		All locked	Local operation is locked	Activate the digital input		X			Configuration
204		Conf. Locked	Configuration is locked	Activate the digital input		X			Configuration
205		Panel locked	Input locked			X			Configuration
206		Simulation	Simulation active	Terminate simulation.		X			Configuration
207		Squawk*	'Find device' activated	Deactivate function in DTM or EDD		X			Configuration
208		HART Locked	Write protection activated via HART	Deactivating write protection		X			Configuration
209		HART limited	„Config via HART" deactivated	Activate „Config via HART" via the HMI		X			Configuration

* Function available only via HART®7

14 Maintenance

The positioner does not require any maintenance if it is used as intended under normal operating conditions.

Note
Manipulation by users shall immediately render the warranty for the device invalid.
To ensure fault-free operation, it is essential that the device is supplied with instrument air that is free of oil, water, and dust.

Note
Perform a functional check of the emergency shutdown module (option) at least every 2 years.
For this purpose, the positioner must move the valve into the safety position when the 24 V DC signal (terminal +85 / −86) is interrupted.

15 Repair

Repair and maintenance activities may only be performed by authorized customer service personnel.
When replacing or repairing individual components, use original spare parts.

Returning devices

Use the original packaging or a secure transport container of an appropriate type if you need to return the device for repair or recalibration purposes.
Fill out the return form (see **Return form** on page 90) and include this with the device.
In accordance with the EU Directive governing hazardous materials, the owner of hazardous waste is responsible for its disposal or must observe the following regulations for shipping purposes:
All devices delivered to ABB must be free from any hazardous materials (acids, alkalis, solvents, etc.).

Please contact Customer Center Service acc. to page 5 for nearest service location.

16 Recycling and disposal

Note



Products that are marked with the adjacent symbol may **not** be disposed of as unsorted municipal waste (domestic waste).
They should be disposed of through separate collection of electric and electronic devices.

This product and its packaging are manufactured from materials that can be recycled by specialist recycling companies.

Bear the following points in mind when disposing of them:

- As of 8/15/2018, this product will be under the open scope of the WEEE Directive 2012/19/EU and relevant national laws (for example, ElektroG - Electrical Equipment Act - in Germany).
- The product must be supplied to a specialist recycling company. Do not use municipal waste collection points. These may be used for privately used products only in accordance with WEEE Directive 2012/19/EU.
- If there is no possibility to dispose of the old equipment properly, our Service can take care of its pick-up and disposal for a fee.

17 Specification

Note
The device data sheet is available in the ABB download area at www.abb.com/positioners.

18 Additional documents

Note
All documentation, declarations of conformity, approvals, certificates and additional documentation are available in the ABB download area.
www.abb.com/positioners

Trademarks

HART is a registered trademark of FieldComm Group, Austin, Texas, USA

19 Accessories

Extension modules

Mechanical position indicator
Indicator disk in housing cover linked with device feedback shaft.

Contactless position sensor (optional)
In difficult ambient conditions (constant valve movements, for example, which are transmitted to the sensor axis by the process pressure), the positioner can be fitted with a contactless position sensor.

Pressure option
The pressure option comprises 3 absolute pressure sensors which facilitate pressure-based valve diagnostics (valve signature, for example).
The supply air pressure and the output pressures can also be monitored. The zero points of the pressure sensors can be calibrated both locally on the device and using the DTM.

These options are also available for retrofitting by Service.

Accessories

Mounting material
- Attachment kit for linear actuators in accordance with DIN / IEC 534 / NAMUR
- Attachment kit for rotary actuators in accordance with VDI / VDE 3845
- Attachment kit for integral mounting
- Attachment kit for actuator-specific mounting

Pressure gauge block
With pressure gauges for supply air and output pressure.
Pressure gauges with housing ø 28 mm (1.10 in), with connection block in aluminum, black

PC adapter for communication
USB HART® Modem for HART® communication (see data sheet 63-6.71)

Control program for operation and parameterization on a PC
DAT200 Asset Vision Basic with DTM for EDP300 (see data sheet DS/DTM/DAT200)

20 Appendix

Return form

Statement on the contamination of devices and components
Repair and/or maintenance work will only be performed on devices and components if a statement form has been completed and submitted.
Otherwise, the device/component returned may be rejected. This statement form may only be completed and signed by authorized specialist personnel employed by the operator.

Customer details:

Company:	
Address:	
Contact person:	Telephone:
Fax:	Email:

Device details:

Type:	Serial no.:
Reason for the return/description of the defect:	

Was this device used in conjunction with substances which pose a threat or risk to health?

☐ Yes ☐ No

If yes, which type of contamination (please place an X next to the applicable items):

☐ biological	☐ corrosive / irritating	☐ combustible (highly / extremely combustible)
☐ toxic	☐ explosive	☐ other toxic substances
☐ radioactive		

Which substances have come into contact with the device?

1.
2.
3.

We hereby state that the devices/components shipped have been cleaned and are free from any dangerous or poisonous substances.

Town/city, date Signature and company stamp

Control Drawing 901305

Model EDP300-AABCDEFGH PositionMaster.
Max Entity Parameters: Per Control Drawings
AA = Approval F1
B = Input Signal A, H
C = Pneumatic Output Type 1, 2
D = Safe Position S, F
E = Air Pipe Connection 1, 2
F = Cable Conduits A, B, C, D
G = Options- A1, A2, A3, B1, B2, B3, B4 (modules), D1, F1, F2 (position Indicator), P8 (natural gas option), (additional codes indicating usage, handling and preparation of certificates)
H = Positions sensor type K1, K2

NI Cl I, II, III, Div. 2, Gp. ABCDEFG T4/T6
Cl I, Zone 2, AEx/Ex nA IIC T4/T6 Gc
Cl I, Zone 2, AEx/Ex ec IIC T4/T6 Gc
DIP Cl II, III, Div. 1, Gp. EFG T4/T6
Zone 21, AEx tb IIIC T70°C/T115°C Db
IS Cl I, II, III, Div. 1, Gp. ABCDEFG T4/T6
Cl I, Zone 0, AEx/Ex ia IIC T4/T6 Ga
Zone 20, AEx/Ex ia IIIC T70°C/T115°C Da

Ta: see certificate
Type 4X, IP64

INTRINSICALLY SAFE, input rated 30V dc max, 4–20mA

1. The Intrinsic Safety Entity concept allows the interconnection of two Intrinsically safe devices approved by FM Approvals with entity parameters not specifically examined in combination as a system when:
   U_o or V_{oc} or $V_t < U_i$,
   I_o or I_{sc} or $I_t < I_i$,
   $P_o < P_i$
   C_a or $C_o > C_i + C_{cable}$,
   L_a or $L_o > L_i + L_{cable}$,
2. A dust tight seal must be used at the conduit entry when the positioner is used in a Class II & III Location.
3. Control equipment connected to the Associated Apparatus must not use or generate more than 250 V_{rms} or V_{dc}.
4. Installation should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe System for Hazardous (Classified) Locations” and the National Electrical Code (ANSI/NFPA 70) Sections 504 and 505 as well as the Canadian Electrical Code Sections 18 and 20.
5. The configuration of associated apparatus must under the associated concept of NEC and/or CEC.
6. Associated Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
7. No revision to drawing without prior Factory Mutual Research Approval.
8. WARNING- EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
9. WARNING- TO PREVENT IGNITION OF FLAMMABLE OR COMBUSTIBLE ATMOSPHERES, DISCONNECT POWER BEFORE SERVICING.
10. Preventing electrostatic charging
    Due to the possibility of impermissible electrostatic charging of the housing occurring, the effects of high-voltage sources on the equipment must be prevented. Electrostatic charging can also occur if the device is wiped with a dry cloth or if large amounts of dust flow around the device in dusty environments. To prevent charging of this type from occurring, the device may only be cleaned using a damp cloth. Dust flowing round the device should be prevented by installing a flow restrictor or partition.
11. If the PositionMaster EDP300 is used according to temperature class T6, before the pressure supply is fully switched on, the pneumatic unit shall be operated with a maximum pressure of 1,4 bar for so long until no more explosive mixture is present, but at least 5 minutes. During this operation the EDP300 is to be fully loaded and vented for several-times.

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	1 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

… 20 Appendix

… Control Drawing 901305

12. The usage of the PositionMaster with natural gas is only permitted in type of protection “Intrinsic Safe”.
13. If the PositionMaster is used with natural gas, the venting of the PositionMaster has to be routed safely to outside the hazardous area.
14. If the PositionMaster uses natural gas instead of compressed air, the maximum ambient temperature is 60 °C.
15. Limit switches are not permitted for use in this product.
16. Max. pressure of the attached pressure supply is 174 psi (12 bar absolute).
17. The customer needs to choose a suitable cable gland that complies with Type 4X (NEMA 250) requirements and meets the area ratings for the device installation.

NONINCENDIVE, input rated 30V dc max, 4–20mA

1. Nonincendive wiring concept: The nonincendive wiring concept allows the interconnection of devices with nonincendive wiring parameters: U_i, I_i, P_i see tables down below.
2. Nonincendive wiring parameters:
3. U_o or V_{oc} or V_t < U_i,
   I_o or I_{sc} or I_t < I_i,
   P_o < P_i
   C_a or C_o > C_i + C_{cable},
   L_a or L_o > L_i +L_{cable},
4. The configuration of Associated Nonincendive Field Wiring Apparatus must be NEC and/or CEC approved under nonincendive wiring concept.
5. Associated Nonincendive Field Wiring Apparatus manufacturer’s installation drawing must be followed when installing this equipment.
6. WARNING- Explosion Hazard - do not disconnect equipment unless power has been switched off or area is known to be nonhazardous.
7. WARNING- explosion hazard - Substitution of components may impair suitability for class I, division 2.
8. Preventing electrostatic charging
   Due to the possibility of impermissible electrostatic charging of the housing occurring, the effects of high-voltage sources on the equipment must be prevented. Electrostatic charging can also occur if the device is wiped with a dry cloth or if large amounts of dust flow around the device in dusty environments. To prevent charging of this type from occurring, the device may only be cleaned using a damp cloth. Dust flowing round the device should be prevented by installing a flow restrictor or partition.
9. If the PositionMaster EDP300 is used according to temperature class T6, before the pressure supply is fully switched on, the pneumatic unit shall be operated with a maximum pressure of 1,4 bar for so long until no more explosive mixture is present, but at least 5 minutes. During this operation the EDP300 is to be fully loaded and vented for several-times.
10. This product is not permitted for use with natural gas.
11. With optional Limit Switches (aa, see coding)
    a. G = F2, Proximity switches (Normally Closed) Type SJ2-SN
    b. G = blank, without Limit Switches
12. Max. pressure of the attached pressure supply is 174 psi (12 bar absolute).
13. The customer needs to choose a suitable cable gland that complies with Type 4X (NEMA 250) requirements and meets the area ratings for the device installation.

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	2 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

DUST IGNITION-PROOF, input rated 30V dc max, 4–20mA

1. Natural Gas is not allowed for use with the EDP300 marked with DIP.
2. Do not open the housing to avoid loss of the protection rating.
3. Only use cable glands that are approved for the protection rating and comply with an IP protection class of at least IP 6X, ensuring they meet the area ratings for the device installation.
4. Avoid hazards from propagating brush discharges.
5. Control equipment connected to the associated apparatus must not use or generate more than 250 Vrms or Vdc.
6. Installation must comply with ANSI/ISA RP12.6 (except Chapter 5 for FISCO installations) and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
7. Output current must be limited by a resistor so that the output voltage-current plot is a straight line between open-circuit voltage and short-circuit current.
8. Local communication interface (LKS) and programming interface (X5) must only be operated outside hazardous explosive areas.
9. Tampering or using non-factory components may compromise safety. Substituting components may impair suitability for hazardous locations.
10. For FM Division 2 use: Do not connect or disconnect unless power is off or the area is confirmed to be non-hazardous.
11. Prevent electrostatic charging.
12. Avoid high-voltage sources that could cause impermissible electrostatic charging of the housing.
13. Do not wipe the device with a dry cloth or expose it to large amounts of dust, as this can cause electrostatic charging.
14. Clean the device only with a damp cloth to prevent electrostatic buildup.
15. Prevent dust flow around the device by installing a flow restrictor or partition.
16. Use a dust-tight conduit seal when installed in Class II and Class III environments.
17. Use conduit hubs with the same environmental rating as the enclosure when connecting conduit.

For Nonincendive Class /Div, Ex nA and Ex ec:
T6 -40˚C ≤ Ta ≤ +40˚C
T4…T1 -40˚C ≤ Ta ≤ +80˚C

For Dustignitionproof Class/Div :
T6 -40˚C ≤ Ta ≤ +40˚C
T4 -40˚C ≤ Ta ≤ +85˚C

For Intrinsic Safety Class/Div., Ex ia :
T6 -40˚C ≤ Ta ≤ +40˚C
T4 -40˚C ≤ Ta ≤ +85˚C (60˚C Maximum with natural gas)

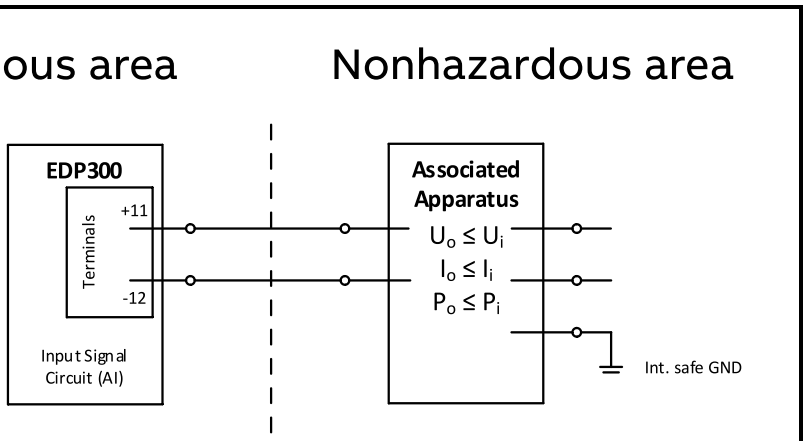
For Ex ia (Dust):
T_{200} 70˚C -40˚C ≤ Ta ≤ +40˚C
T_{200} 115˚C -40˚C ≤ Ta ≤ +85˚C (60˚C Maximum with natural gas)

For Ex tb (Dust):
T_{200} 70˚C -40˚C ≤ Ta ≤ +40˚C
T_{200} 115˚C -40˚C ≤ Ta ≤ +85˚C

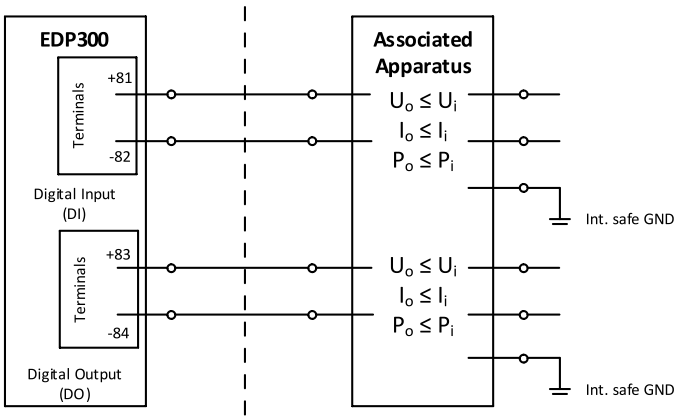
					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	3 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

… 20 Appendix

… Control Drawing 901305



	T1 - T4	T6
U_i	30 V	28 V
I_i	320 mA	320 mA
P_i	1,1 W	0,8 W
C_i	6,5 nF (8,8nF with pressure option)	
L_i	negligible small	

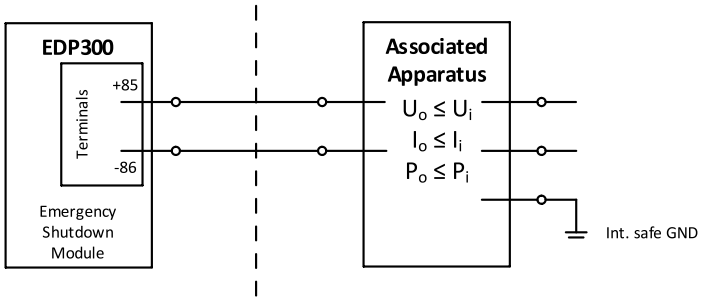


	T1 - T4	T6
U_i	30 V	28 V
I_i	320 mA	320 mA
P_i	0,5 W	0,4 W
C_i	4,2 nF	
L_i	negligible small	

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	4 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

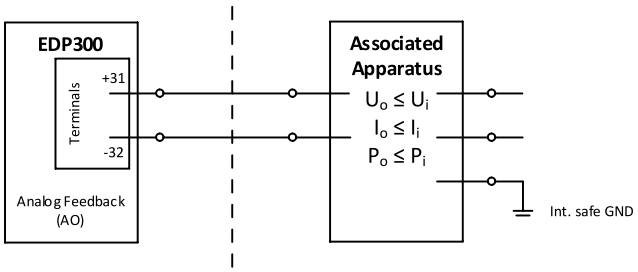
Hazardous area Nonhazardous area

Ordering Option G=B4



	T1 - T4	T6
U_i	30 V	
I_i	320 mA	
P_i	1 W	
C_i	5,3 nF	
L_i	negligible small	

Ordering Option G=A1 or B1



	T1 - T4	T6
U_i	30 V	28 V
I_i	150 mA	150 mA
P_i	1,0 W	0,8 W
C_i	11,3 nF	
L_i	150 µH	

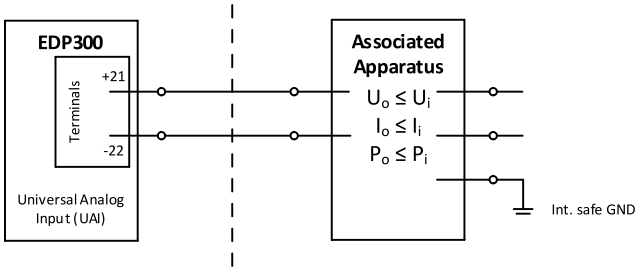
					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	5 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

… 20 Appendix

… Control Drawing 901305

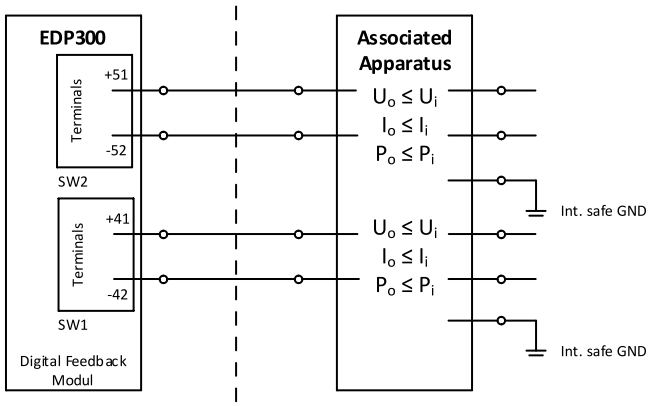
Hazardous area Nonhazardous area

Ordering Option G=A3 or B3



	T1 - T4	T6
U_i	30 V	28 V
I_i	150 mA	150 mA
P_i	1,0 W	0,8 W
C_i	11,3 nF	
L_i	150 µH	

Ordering Option G=A2 or B2

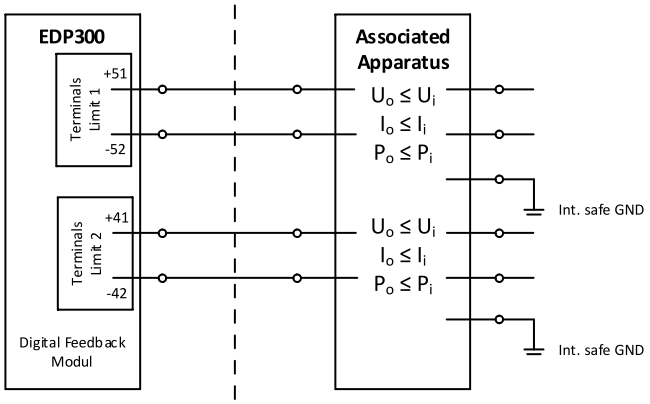


	T1 - T4	T6
U_i	30 V	28 V
I_i	150 mA	150 mA
P_i	0,5 W	0,5 W
C_i	2,2 nF each output	
L_i	negligible small	

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	6 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

Hazardous area Nonhazardous area

Ordering Option G=F2



T1 - T4	T6
Pepperl+Fuchs, Inc. Inductive slot sensor. Type (F2) SJ2-S1N cULus Listed, see Control Drawing No. 116-0454	

For DIP marking:

Circuit	Maximum Values
Signal Circuit (AI) (Terminals +11, -12)	Umax ≤ 30V; In ≤ 22mA
Digital Input (DI) (Terminals +81, -82)	Umax ≤ 30V, In ≤ 22mA
Digital Output (DO) (Terminals +83, -82)	Umax ≤ 30V, In ≤ 22mA
Shutdown Module (Terminals +85, -86)	Umax ≤ 30V, In ≤ 22mA
Analog Feedback Module (Terminals+31, -32)	Umax ≤ 30V; In ≤ 22mA
Universal Analog Input Module (Terminals +21, -22)	Umax ≤ 30V; In ≤ 22mA
Digital Feedback Module (Terminals SW1:+41, -42; SW2:+51,-52)	Umax ≤ 30V, In ≤ 22mA
Digital Output (DO) (Limit1:Terminals +51, -52; Limit2: Terminals +41, -42)	Umax ≤ 16V; In ≤ 25mA

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			**EDP300**	
4		05.04.13	Lasar	ABB AG				
3		20.03.12	Lasar				Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				**901305**	7 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

… 20 Appendix

… Control Drawing 901305

EDP300 Natural Gas Operation

Ordering Option GG=P8

Notes:

1. The usage of the PositionMaster with natural gas is only permitted in type of protection “Intrinsic Safe”.
2. If the PositionMaster is used with natural gas, the venting of the PositionMaster has to be routed safely to outside the hazardous area.
3. If the PositionMaster uses natural gas instead of compressed air, the maximum ambient temperature is 60 °C.
4. Only PositionMaster models with ordering option P8 may be operated with natural gas.
5. The natural gas operation can only be accomplished with clean, dry, non-sulfurous, additive-free natural gas.
6. Do not operate the PositionMaster with natural gas in closed or non-ventilated areas.
7. Natural gas continuously vent through the PositionMaster housing and must always be directed away from the PositionMaster to a safe discharge area outside the hazardous area, by piping or tubing connected to the PositionMaster vent ports.
8. Special care must be taken during maintenance activities at or near the positioner and actuator because of the presence of pressurized natural gas. Depressurize and vent actuators and devices connected to the pressurized natural gas supply carefully to a nonhazardous atmosphere, and wait several minutes for complete depressurization.
9. Vent tubing connection requirement, shown as VENT A & VENT B (above), is ¼” NPT. The tubing size for Vent A & Vent B should match the supply tubing size.
10. The vent tubing system at VENT A must be designed and implemented to minimize the back pressure to less than 1 PSIG.

					Date	Name	Title	Scale
7		31.10.25	M. Möller	Drawn	15.03.11	Kresse	Control Drawing	
6		09.03.17	Lasar	Appr..	28.09.11	Schaeff		
5		19.11.14	Lasar	Std.			EDP300	
4		05.04.13	Lasar					
3		20.03.12	Lasar	ABB AG			Draw.-No. (Part-No.)	Sheet
2		16.01.12	Lasar					
1		28.09.11	Schaeff				901305	8 / 8
Rev.	Change	Date	Name				Supersedes Dwg.	Part. Class

Notes

ABB Measurement & Analytics

For your local ABB contact, visit:
www.abb.com/contacts

For more product information, visit:
www.abb.com/positioners

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail.
ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.

© ABB 2025

3KXE341010R4201

OI/EDP300-EN Rev. H 11.2025