

# 1600 Series Intelligent Electropneumatic Valve Positioner

1600 Position controller

1601 Process controller

- Compact stainless steel design
- Electrical waterproof connectors
- LCD with backlight
- Easy to start-up
- Rich additional software functions



**1600 series intelligent electro-pneumatic valve positioner is designed for integral pneumatic control valve, particularly suitable for angle seat valves and diaphragm valves.**

**The product is easy to operate and has rich software functions.**

**It can easily be operated via the LCD and keypad.**

**The positioner adjusts the valve position quickly and accurately through detecting the position sensor signal.**

| Technical data                        |                                                                                                                                                 |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Material                              | PC、PA6-GF30、Stainless Steel、SI                                                                                                                  |
| Power supply                          | 24V DC $\pm 10\%$                                                                                                                               |
| Set-point signal (1600/1601)          | 0/4-20mA or 0-5/10 V                                                                                                                            |
| Input resistance for set-point signal | 240 $\Omega$ at 0/4-20mA, 20K at 0-5/10V                                                                                                        |
| Control medium                        | neutral gases, air DIN ISO 8573-1<br>Solid particle size and density Class 3<br>Dew point Class 3<br>Oil content Class 3                        |
| Dust concentration                    |                                                                                                                                                 |
| Particle density                      |                                                                                                                                                 |
| Pressure condensation point           |                                                                                                                                                 |
| Oil concentration                     |                                                                                                                                                 |
| Ambient temperature                   | 0-60° C                                                                                                                                         |
| Pneumatic connection                  | Plug-in hose connector G1/4(internal $\Phi 6\text{mm}$ )                                                                                        |
| Electrical connection                 | M12 3-pins B-coded(cable $\varnothing$ 4-6mm)<br>M12 4-pins D-coded(cable $\varnothing$ 4-6mm)<br>M12 5-pins A-coded(cable $\varnothing$ 4-6mm) |
| Supply pressure                       | 3~7 bar, specific values depending on the actuator                                                                                              |
| Air flow rate                         | 17 l/min(input pressure of 0.6Mpa)<br>95 l/min(input pressure of 0.6Mpa ,only single-acting)                                                    |
| Stroke control range                  | Line 5-50mm<br>Angle 90°                                                                                                                        |
| Installation                          | As required, Preferably with actuator in upright position, Screw                                                                                |
| Protection class                      | IP67                                                                                                                                            |
| Power consumption                     | <5W                                                                                                                                             |
| Linearity & Hysteresis                | Linearity: $\leq 0.5\%$ , Hysteresis: $\leq 0.5\%$                                                                                              |

## Combinations

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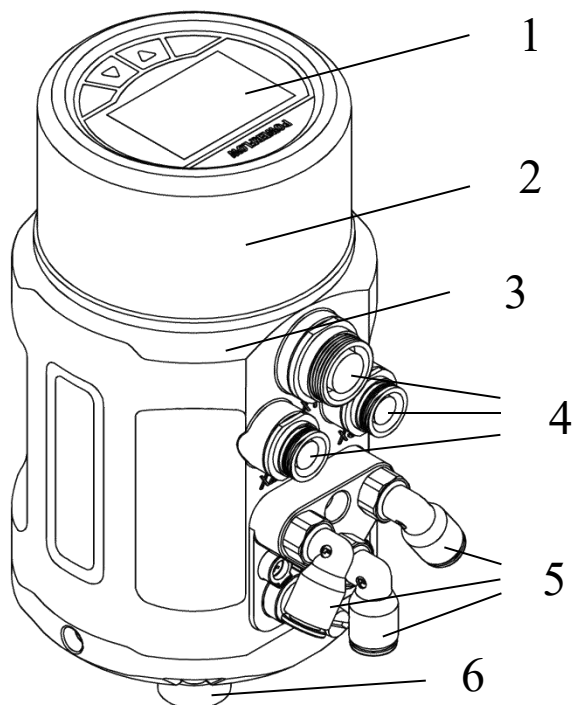
**Diaphragm control valve**



**Angle seat control valve**

## Structure

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1. **LCD and key panel**
2. **Stainless steel body casing**
3. **Main body casing**
4. **Electrical connection**
5. **Pneumatic connection**
6. **Actuator connection**

## Selection and ordering data

|                                                                             |                                   |
|-----------------------------------------------------------------------------|-----------------------------------|
| 1600 Without process control function<br>1601 With process control function | Product series                    |
| N No feedback signal<br>Y 4-20mA feedback signal                            | Feedback signal                   |
| S Single-acting<br>D Double-acting                                          | Actuator type                     |
| S2 Line 5-25 mm<br>S3 Line 25-50 mm<br>S4 Angle 90°                         | Valve max stroke                  |
| Q1 17 l/min<br>Q2 95 l/min                                                  | Air flow rate                     |
| T1 G1/4<br>T2 M16 * 1<br>T3 M22 * 1.5<br>T4 M26 * 1.5                       | Thread type                       |
| S Safe<br>F Freeze                                                          | Power off state for single-acting |

|      |   |   |   |   |   |    |   |    |   |    |   |   |
|------|---|---|---|---|---|----|---|----|---|----|---|---|
| 1600 | — | N | — | S | — | S2 | — | Q1 | — | T1 | — | S |
|------|---|---|---|---|---|----|---|----|---|----|---|---|

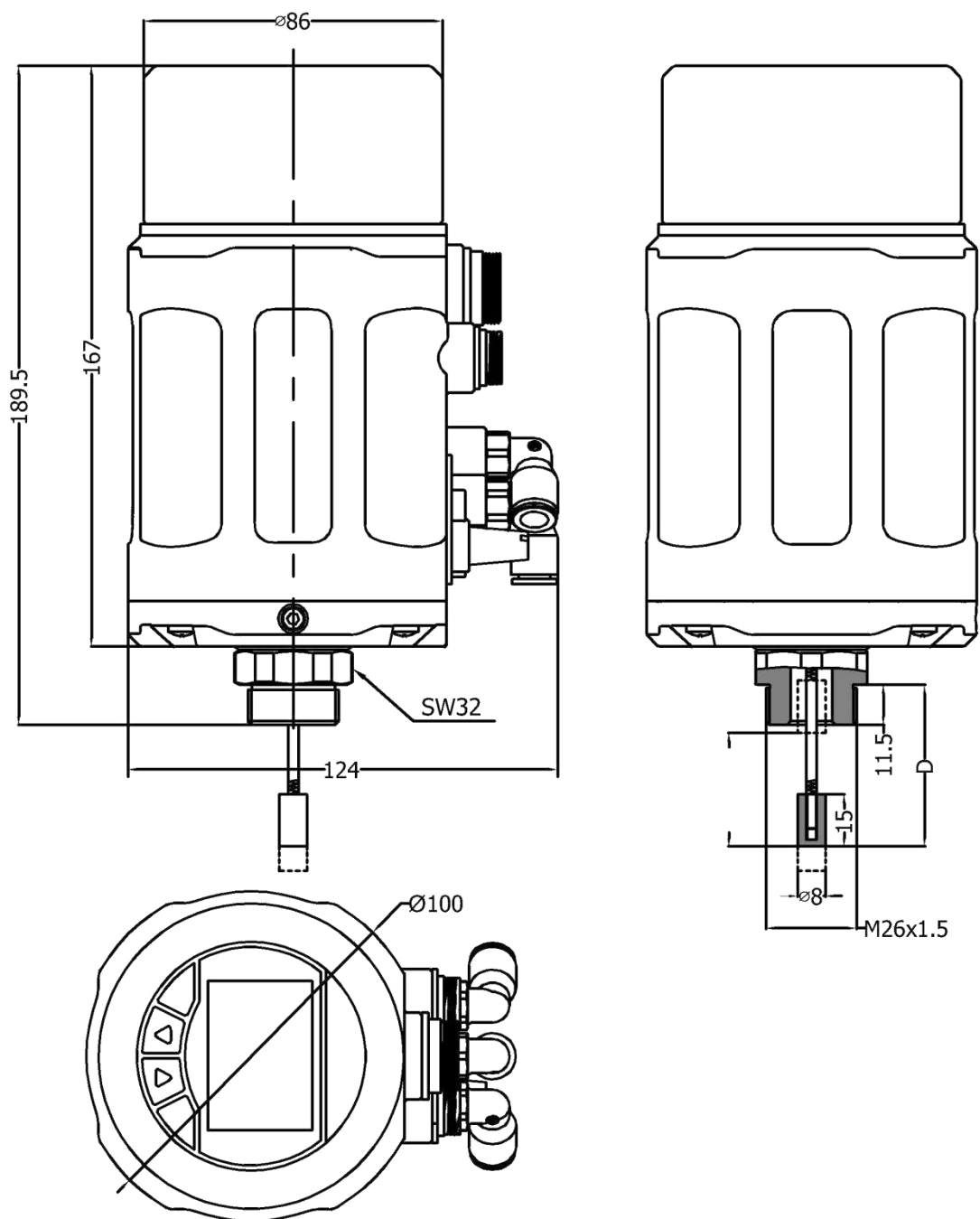
Remark:

In the **air flow rate** option, code Q1 is suggested to match the actuator of 40-100 mm internal gas chamber diameter, code Q2 is suggested to match the actuator of 125-160 mm internal gas chamber diameter. Code **Q2** is only used for **single-acting actuator**, and only in **Freeze** state when power-off. The air flow rates for code Q1 and Q2 are under the condition of 0.6Mpa input pressure.

In the **valve max stroke** option, AT actuator range for code S4 is AT50~AT125. For other actuator models, please consult our company. It is no need to select the **thread type** option for code S4.

**Power off state for single-acting** option is **Safe** by default.

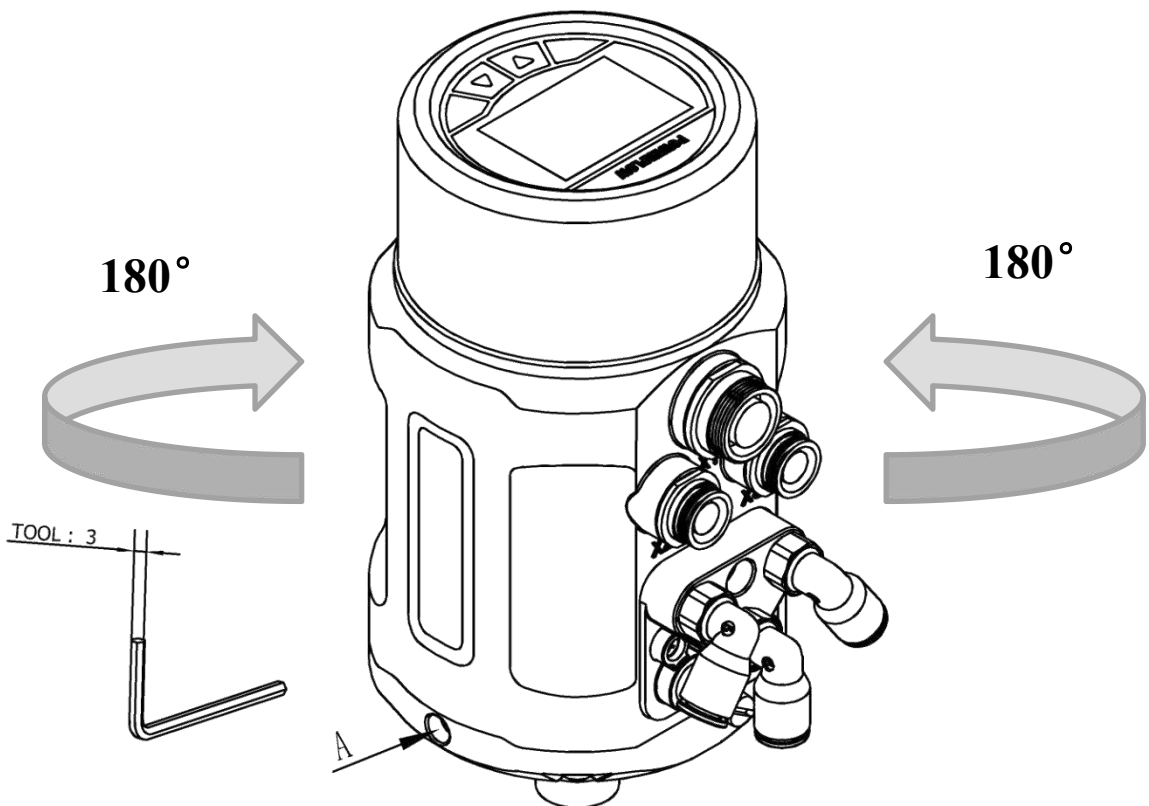
## Dimensions



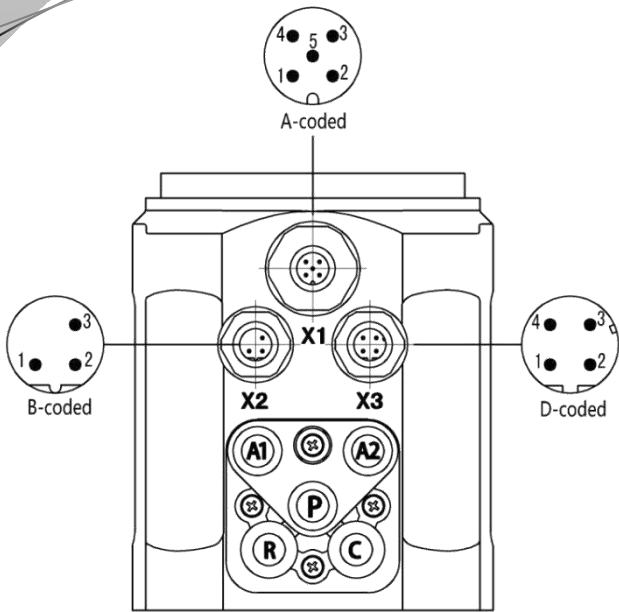
## Interface angle adjustment

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The angel can be adjusted between the positioner and the valve.If need to adjust the interface angle,relaxing the hexagon screw in place A first.Then adjusting the angle clockwise or counter-clockwise in  $180^{\circ}$  range. After adjusting the angle, locking the angle by the hexagon screw.



# Electrical connections



X2 (1601)

| Pin | Description               | Signal type |
|-----|---------------------------|-------------|
| 1   | Transmitter input +       | +24 V       |
| 2   | Transmitter signal output | 4-20 mA     |
| 3   | Transmitter GND           | GND         |

X3 (1600/1601)

| Pin | Description          | Signal type                  |
|-----|----------------------|------------------------------|
| 1   | Power supply +       | +24 V                        |
| 2   | Power supply GND     | GND                          |
| 3   | Set signal input +   | 0/4 – 20 mA<br>or 0 – 5/10 V |
| 4   | Set signal input GND | GND                          |

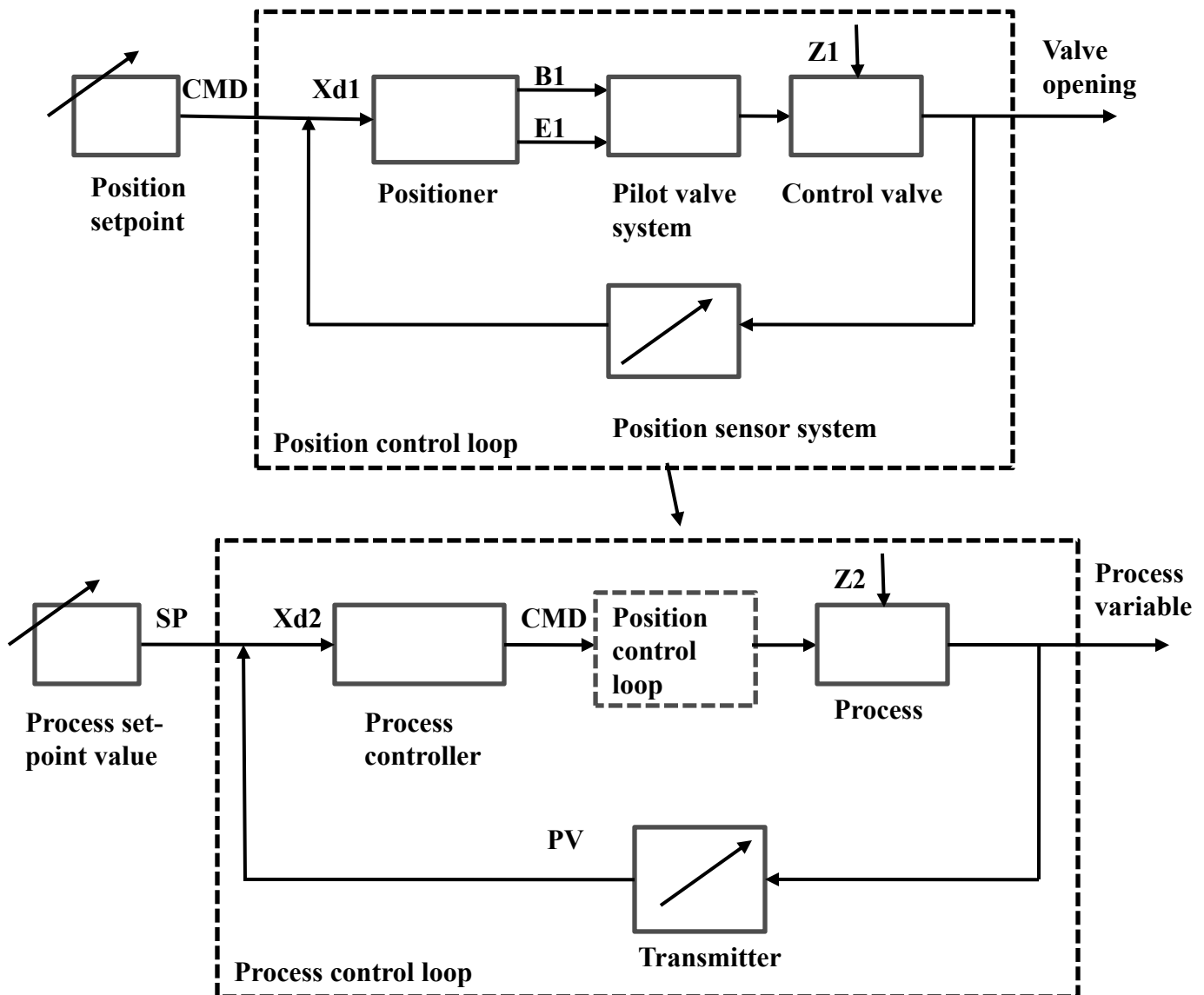
X1 (1600/1601)

| Pin | Description              | Signal type                  |
|-----|--------------------------|------------------------------|
| 1   | Analogue signal output + | 0/4 – 20 mA                  |
| 2   | Binary signal output 1   | 0/24 V                       |
| 3   | Binary signal output 2   | 0/24 V                       |
| 4   | Binary signal input +    | 0-3V = “0” ,<br>15-30V = “1” |
| 5   | Signal common GND        | GND                          |

## Pneumatic connections

|           |                                                                 |
|-----------|-----------------------------------------------------------------|
| <b>P</b>  | Air supply enter(built-in filter, filter size 5 $\mu\text{m}$ ) |
| <b>R</b>  | Air exhaust                                                     |
| <b>C</b>  | Check valve                                                     |
| <b>A1</b> | Pilot air outlet 1                                              |
| <b>A2</b> | Pilot air outlet 2                                              |

## Signal flow diagram



## Additional software functions

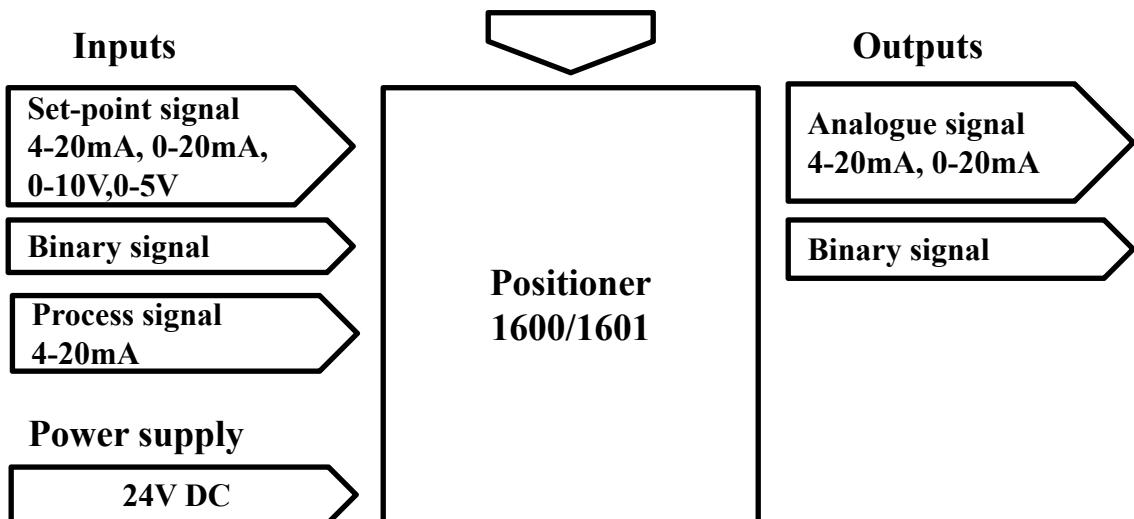
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- Selection of the transfer characteristic between set-point value and stroke.
- Sealing function for position controller.
- Effective sense of direction between input signal and set-point value.
- Limit of the mechanical stroke range.
- Setting for control parameters.
- Safety position setting for the position controller.
- Configuration of signal level fault detection.
- Activating of the binary input.
- Configuration of the outputs.
- Calibrating the control parameters.
- Setting for manual control rate.
- Code protection.

## Schematic diagram

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### Operation through keypad



## Function comparison for all types

| FUNCTION                            | 1600 | 1601 | 1500 |
|-------------------------------------|------|------|------|
| Process control                     | ×    | √    | ×    |
| 4-20mA signal input                 | √    | √    | √    |
| 4-20mA signal output                | ○    | ○    | ○    |
| Autotune                            | √    | √    | √    |
| Valve position manual adjustment    | √    | √    | √    |
| Sealing function                    | √    | √    | √    |
| Dead band setting                   | √    | √    | √    |
| 4-20mA input signal error detection | √    | √    | √    |
| Factory setting                     | √    | √    | √    |
| Characteristic curve setting        | √    | √    | ×    |
| Direction of set-point value        | √    | ×    | ×    |
| Valve stroke range limiting         | √    | √    | ×    |
| Safety position setting             | √    | √    | ×    |
| Binary signal input/output          | ○    | ○    | ×    |
| Input signal calibration            | √    | √    | ×    |
| Speed setting of manual adjustment  | √    | √    | ×    |
| Code protection                     | √    | √    | ×    |

|   |          |
|---|----------|
| √ | YES      |
| × | NO       |
| ○ | optional |