

## SWSP-25 SERIES SMART POSITIONER

- Three-break protection function
- Built-in PTM
- Built-in Limit Switch
- HART Communication

# ABOUT US

SKYWELL is a high-tech auto-control valve accessories manufacturer. The products range are as follows: valve positioner, solenoid valve, limit switch, air filter regulator, pneumatic actuator, electric actuator, electro-hydraulic actuators and other valve accessories. Our products have been widely used in petroleum, chemicals, electric power, metallurgy, steel, water treatment, bio-pharmaceutical, paper making, foodstuff, military and other fields. SKYWELL is certified with ISO9001: 2015 quality management system certification. Besides, our products have obtained CE, ATEX, NEPSI, SIL3 certificates. We always focus on helping customers to get the best effect of flow controls with professional service and excellent quality, and strive to become the world's leading brand of valve accessories.

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**Product Introduction**

1. Introduction

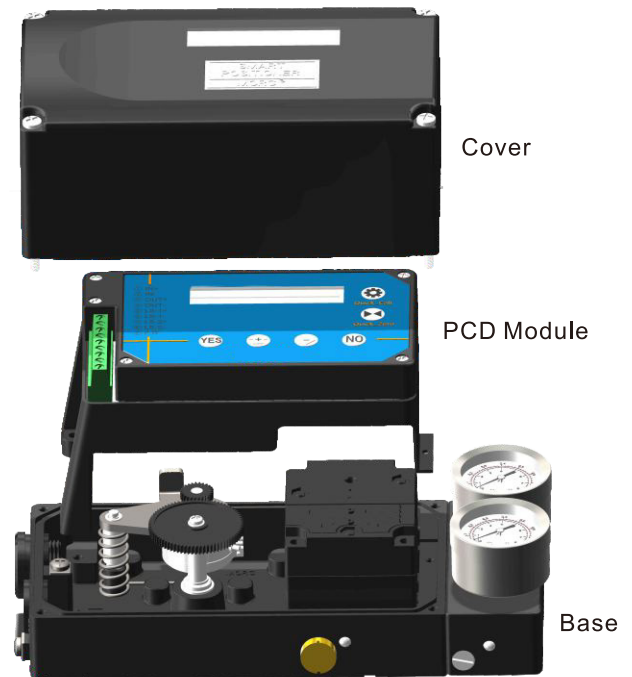
SWSP-25 series smart positoner is a device which controls the valve position in response to an input signal of 4~20mA from controller or control system.

2. Characteristic

- Adopt the advanced piezoelectric valve electric conversion module, and has a unique air path structure, which can effectively reduce the influence of air quality on piezoelectric valve.
- Easy to install and calibration.
- Almost no air consumption when the valve position is stable.
- The same type positoner can be applied to linear and rotary actuators.
- Modular design, less moving parts, easy to maintain.
- With LED backlight display and button operation, simple operation can achieve a variety of functions.
- Can realize automatic diagnosis of valve and actuator.
- Can achieve automatic zero self zero adjustment function through a key.
- Optional three-break protection function, that can hold position when the power , air or signal cut off.

3. Structure

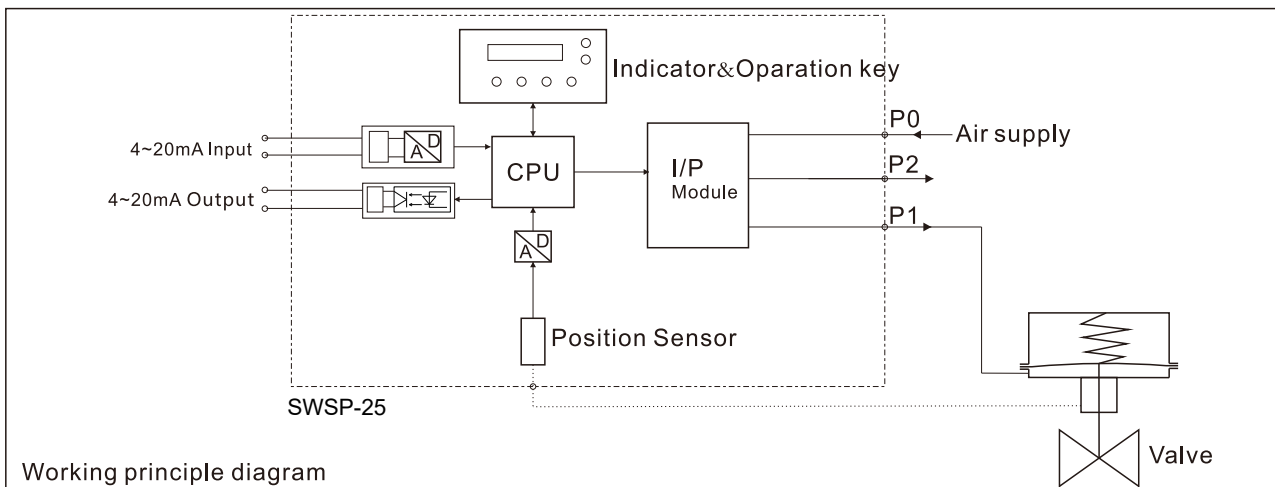
SWSP-25 series valve positoner adopts high integration microprocessor, modular structure design, compact design, beautiful and practical. The shell is made of aluminum alloy and its surface is anti-corrosive. All fasteners and fittings are made of stainless steel which is suitable for corrosive environment. The circuit board is protected by metal casing and has the function of anti-interference shielding, which can effectively prevent interference to various magnetic fields. I/P conversion module adopts intelligent piezoelectric valve module, which can realize the function of fault safe or fault hold.



4. Function

4.1 Working principle

SWSP-25 series valve positoner receives the current signal (given value) in the range of 4-20mA output from the controller or the control system. After A/D conversion, it is compared with the feedback of the current valve position. The microprocessor(CPU) output the corresponding electric signal to electric/gas conversion module(I/P module) according to the size and direction of the difference value. And then adjust the air pressure and air flow size which entered into the actuator by I/P module and to make the valve position change, the valve sensor detects the valve positon and feedback to the microprocessor. When the difference value between set value and feedback value become zero, the I/P module close air path which output to the actuator, the valve position becomes stable until the difference value reappears.



Working principle diagram

#### 4.2 Piezoelectric valve type I/P conversion module

The P13 I/P piezoelectric valve module of German HOERBIGER company is used to realize the function of electric/pneumatic conversion. and different piezoelectric valve modules can realize the function of valve failure hold or failure safe.

#### 4.3 Local Operate

SWSP-25 has built-in LCD display and 6 operation keys. among which 4 menu function keys can realize auto/manual calibrate, Parameter set and manual operate, and 2 shortcut keys can realize quick calibrating and quick zero calibrating.



#### 4.4 Calibration

SWSP-25 can be calibrated manually or automatically through the combination of 4 keys or by the quick calibration key, that is, the zero point and stroke of the valve can be calibrated, and the control parameters can be automatically optimized according to the current valve conditions. When the zero point of the valve has drift, it can be calibrated by the quick calibration key.

#### 4.5 Low air consumption

Compared with the high air consumption of traditional nozzle-type positioners, the air consumption of SWSP-25 is almost 0, which greatly saves the energy consumption of the factory.

#### 4.6 Configuration function

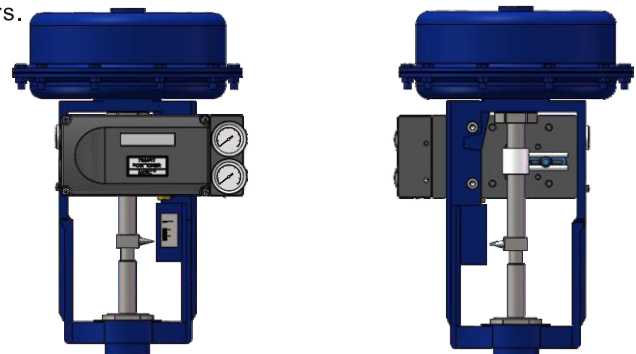
- Manual operation: the operation of valve open and close can be realized by key.
- Automatic calibration: can realize automatic/manual calibration by key.
- Flow character: can realize linear, equal percentage, quick open and custom curve.
- Direct/Reverse action: can realize signal control direction, valve position display direction, valve position feedback direction, etc.
- Shutdown function: make sure maximum positioning pressure of the spool on the seat.
- Split control: can realize split set within 4~20mA range.
- Sensitivity setting: can set the sensitivity within 0.4~1.6% range, and suitable for valves for different kinds of friction.
- Alarm setting: can set limit switch function and high/bottom limit Alarm output function .
- Factory set: can realize to reset to factory default parameters.

#### 4.7 No pipe connection function

SWSP-25 is designed with a standard unpiped joint hole, which can be connected directly to the unpiped-type pneumatic actuator.

#### 4.8 Three-break protection function

SWSP-25 can realize the position holding when power, signal, or supply air cut off.



No pipe connection



**Technical parameter**
**1. Actuator parameters**

Suitable for single or double acting, linear or rotary pneumatic valve actuator.

**2. Functional parameter**
**2.1 Valve stroke range**

Linear stroke: 10~150mm(Lever angle rotation range 20~80°)

Rotary stroke: angle rotation 30~100°

**2.2 Input signal**

Two-wire 4~20mADC, the minimum working current is 3.5mA

Load resistance: 450Ω(without HART), 500Ω(with HART).

**2.3 Built-in PTM signal(4~20mA)**

Two-wire 4~20mADC, with input voltage 9~36VDC;

Load resistance:  $(V_i - 9)/20 \times 1000\Omega$  the max. resistance is 750Ω then 24VDC.

Accuracy: 0.5%F.S.

Electric isolation voltage: 1000V

**2.4 Built-in limit switch**

Working voltage: two-wire 8~32 VDC

Switch/ Alarm output:

OFF: output current < 1.2mA ON: output current > 2.1mA

Optional for NO, NC, Max./Min. alarm, Close alarm configuration etc. output modes.

Limit switch accuracy: 1%

**2.5 HART communication**

Built in HART communication protocol, compatible with Rosemount 275/375/475.

**Pneumatic parameter**

Air supply: compressed air 1.4~7.0bar

Output pressure: Min.0 bar, The maximum output pressure is 0.5 bar smaller than the maximum supply pressure.

Air quality: dry, clean and free of impurities air source.

Dew point is 3°C below minimum operating temperature

Oil content: Max.25mg/m<sup>3</sup>

Filter Precision: 15μm

Flow rate when valve is fully open: 130L/min(@6.0bar), it varies with the change of air supply pressure.

Air consumption under steady condition: < 0.0006Nm<sup>3</sup>/h, with regard to the actuator leakage.

Response time: Open, < 20mS reach 90% air supply pressure; Close, < 20mS reach 10% air supply pressure.

Throttling ratio: Adjustable continuously

**Technique data**

Overload current: 60mA  
Sensitivity:  $\pm 0.5\%$  F.S.  
Linearity:  $\pm 0.5\%$  F.S.  
Repeatability:  $\pm 0.5\%$  F.S.  
Response time: 50mS

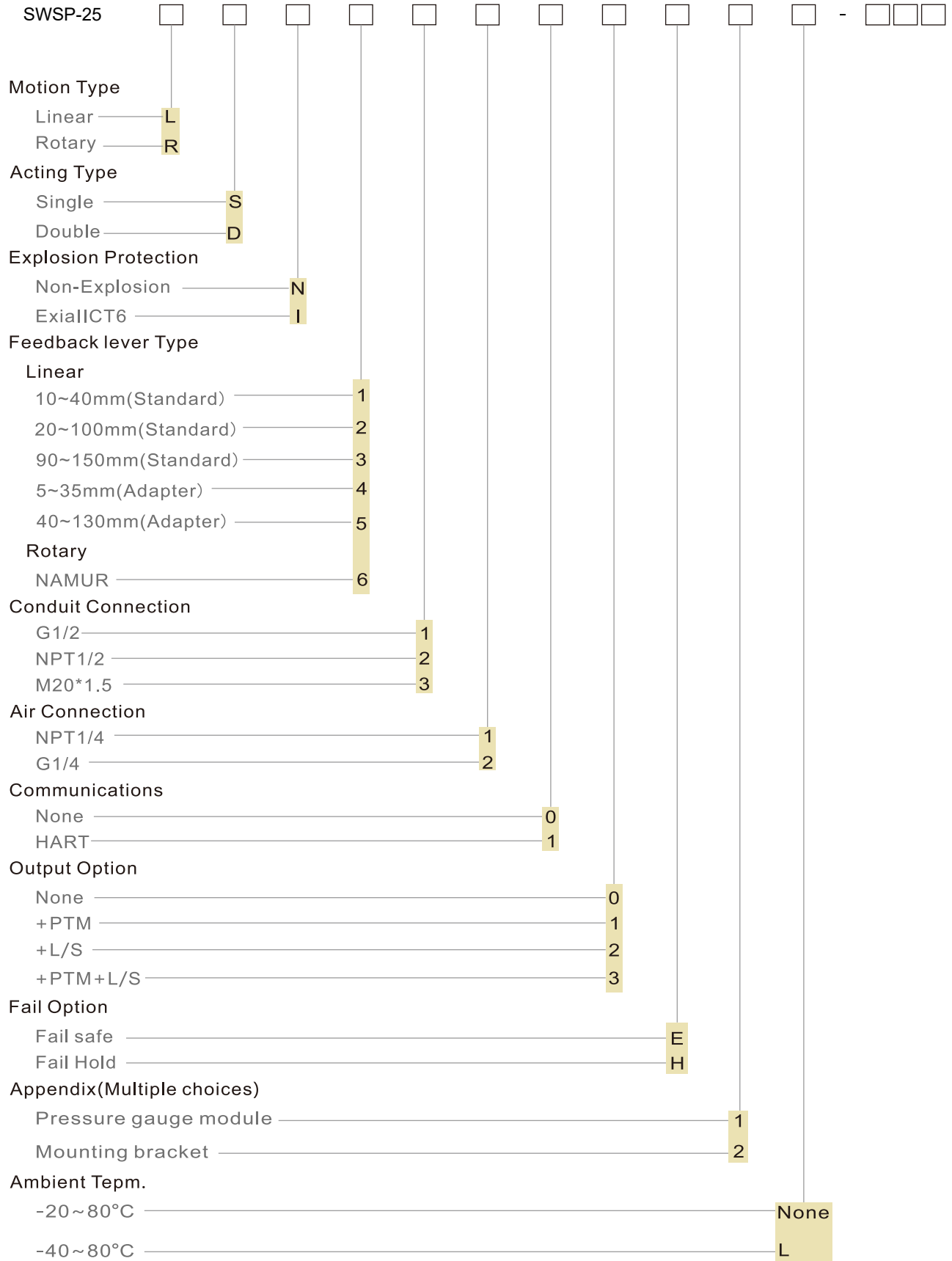
**Explosion parameter**

Intrinsic safety: ExialICT6  
Intrinsic safety:  $U_i=28\text{VDC}$ ,  $I_i=93\text{mA}$ ,  $P_i=0.65\text{W}$ ,  $L_i=0.2\text{mH}$

**Other parameter**

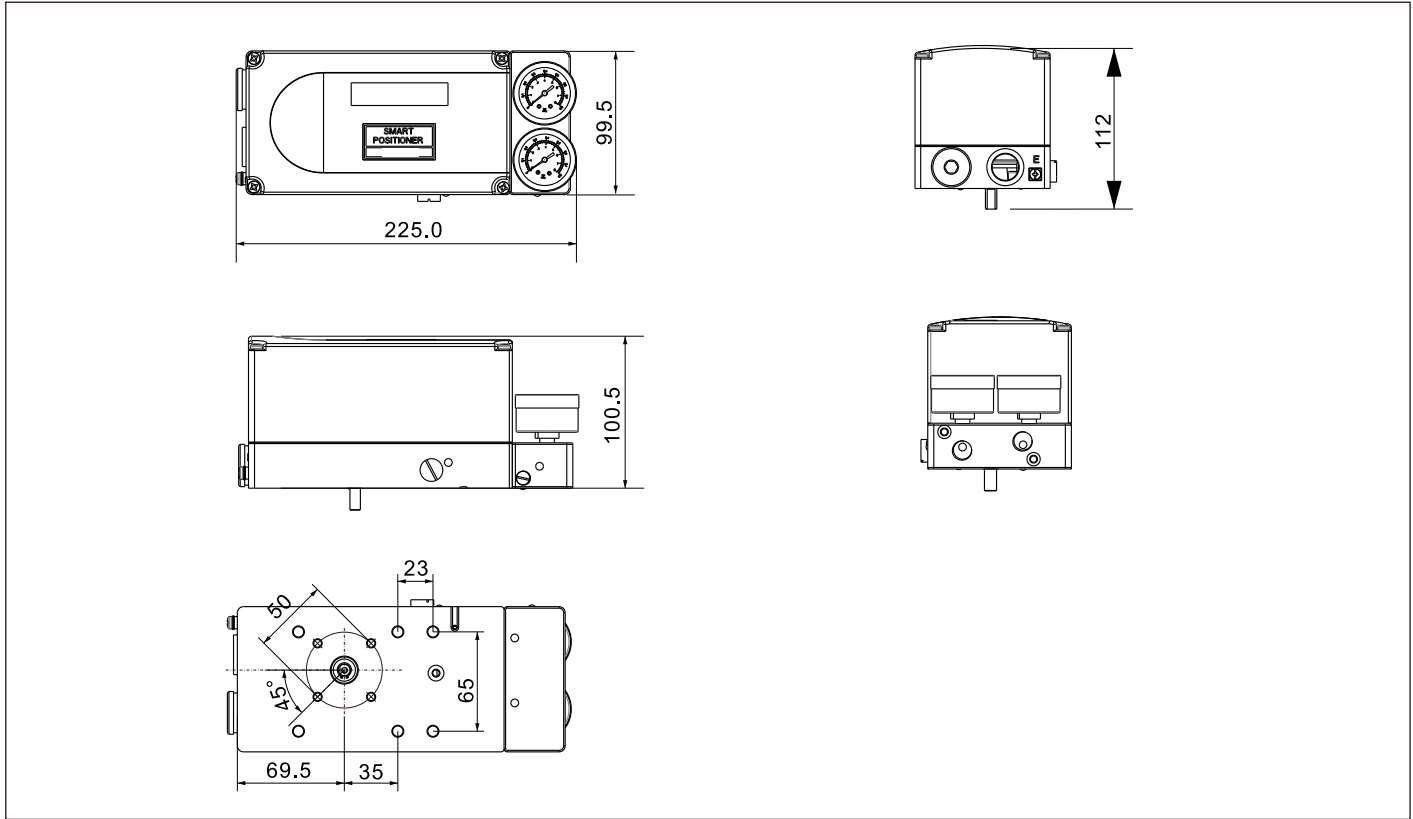
Pneumatic input/output interface: NPT1/4, G1/4  
Electric connection: 2-G1/2, 2-NPT1/2 or 2-M20\*1.5  
Working temperature:  $-20\sim 80^\circ\text{C}$   
IP Grade: IP66  
Seismic resistance: 8g  
Shell material: Aluminum  
Weight: 2.3kg

Product Code

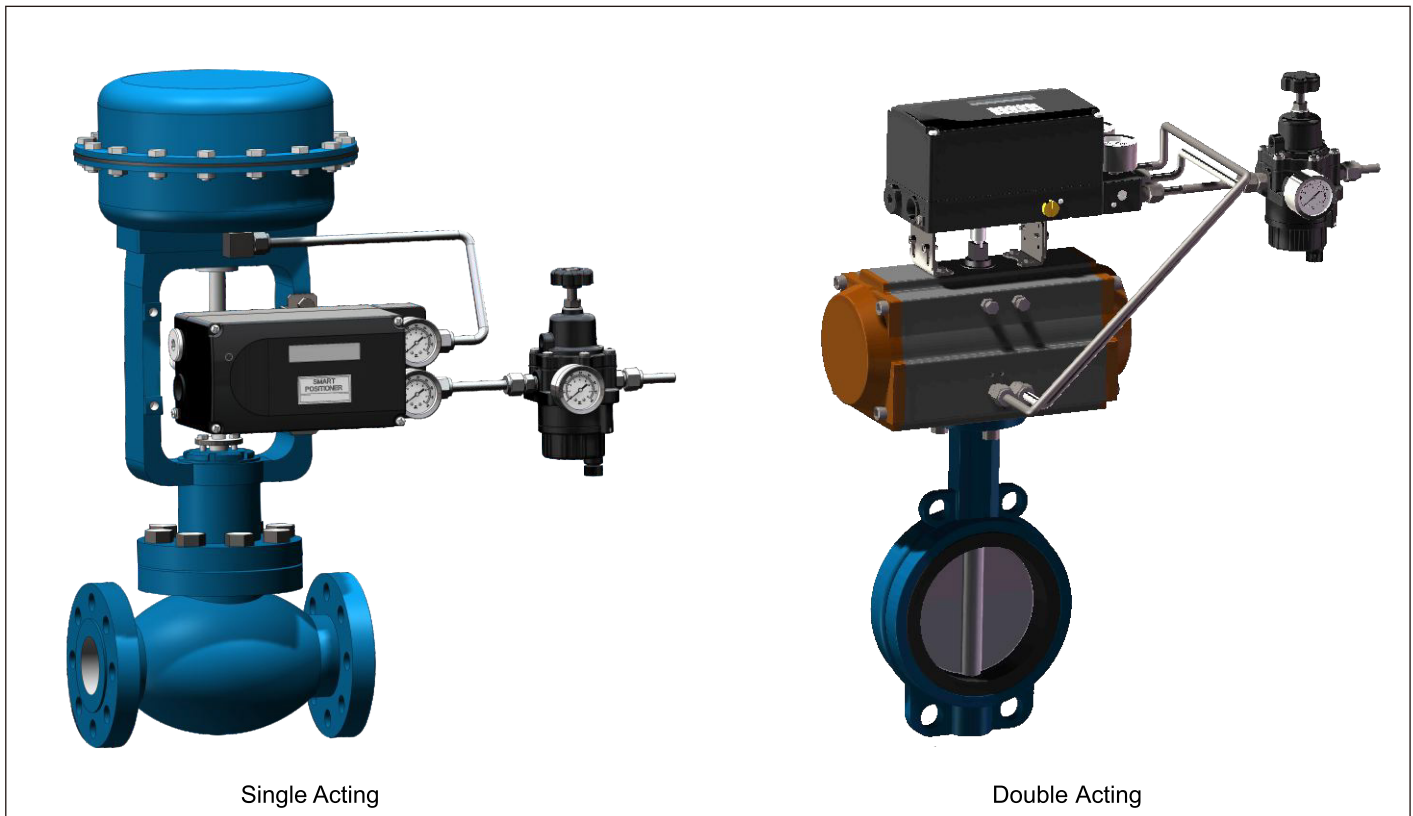


Note : 1.  Special order code.

Outline Dimension



Example of Installation



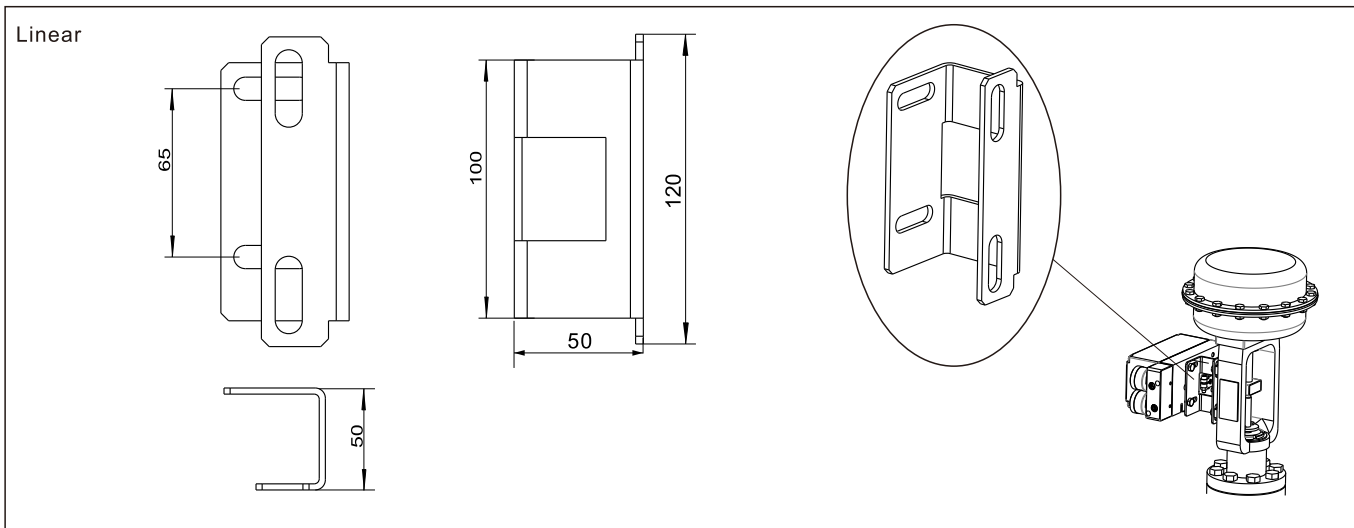
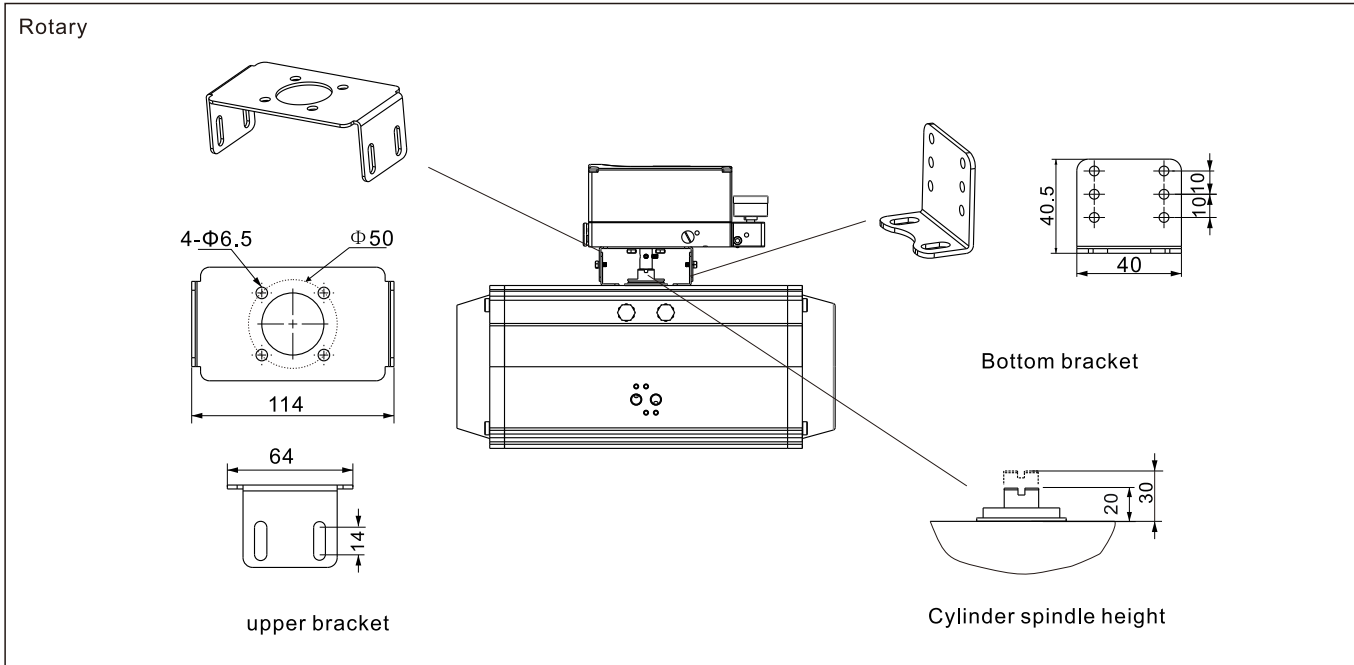
Single Acting

Double Acting

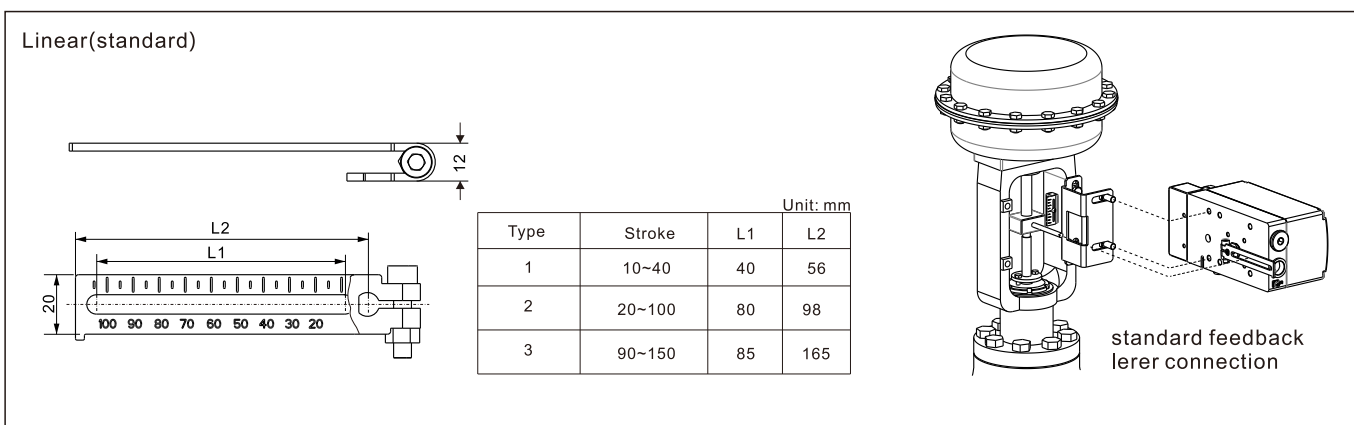


Installation accessories

Mounting bracket



Feedback Lever



Feedback Lever

Linear(Adapt)

Unit: mm			
Type	Stroke	L1	L2
4	5~35	25	35
5	40~130	68	92

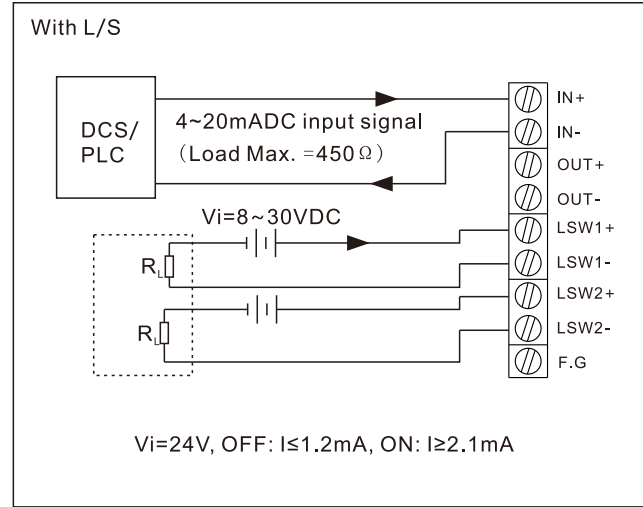
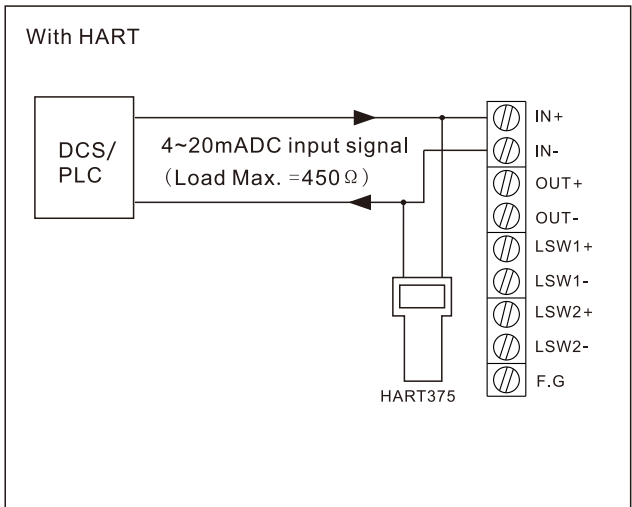
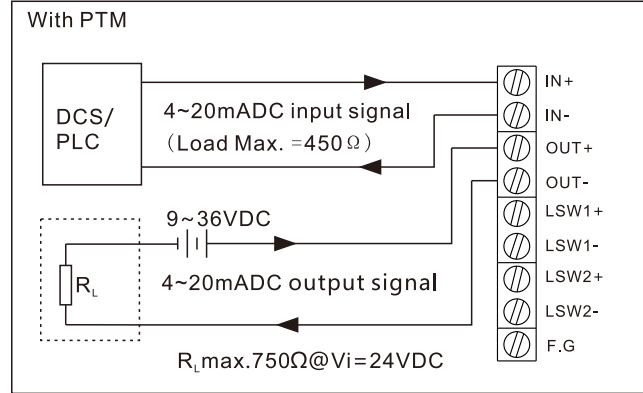
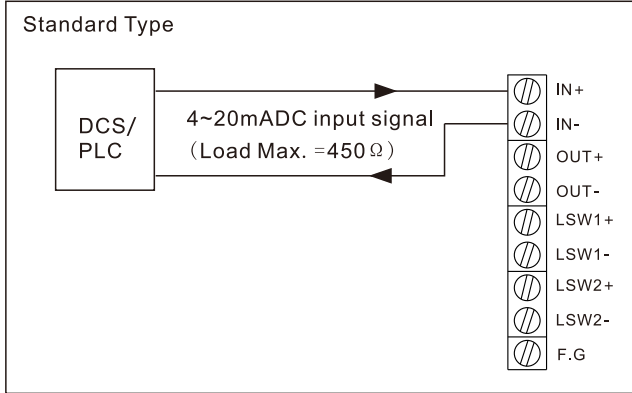
Rotary

Gauge Module

Single Acting

Double Acting

Wiring diagram





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