

WTLCCS

L8A-100 Electric Valve Positioner

User Manual



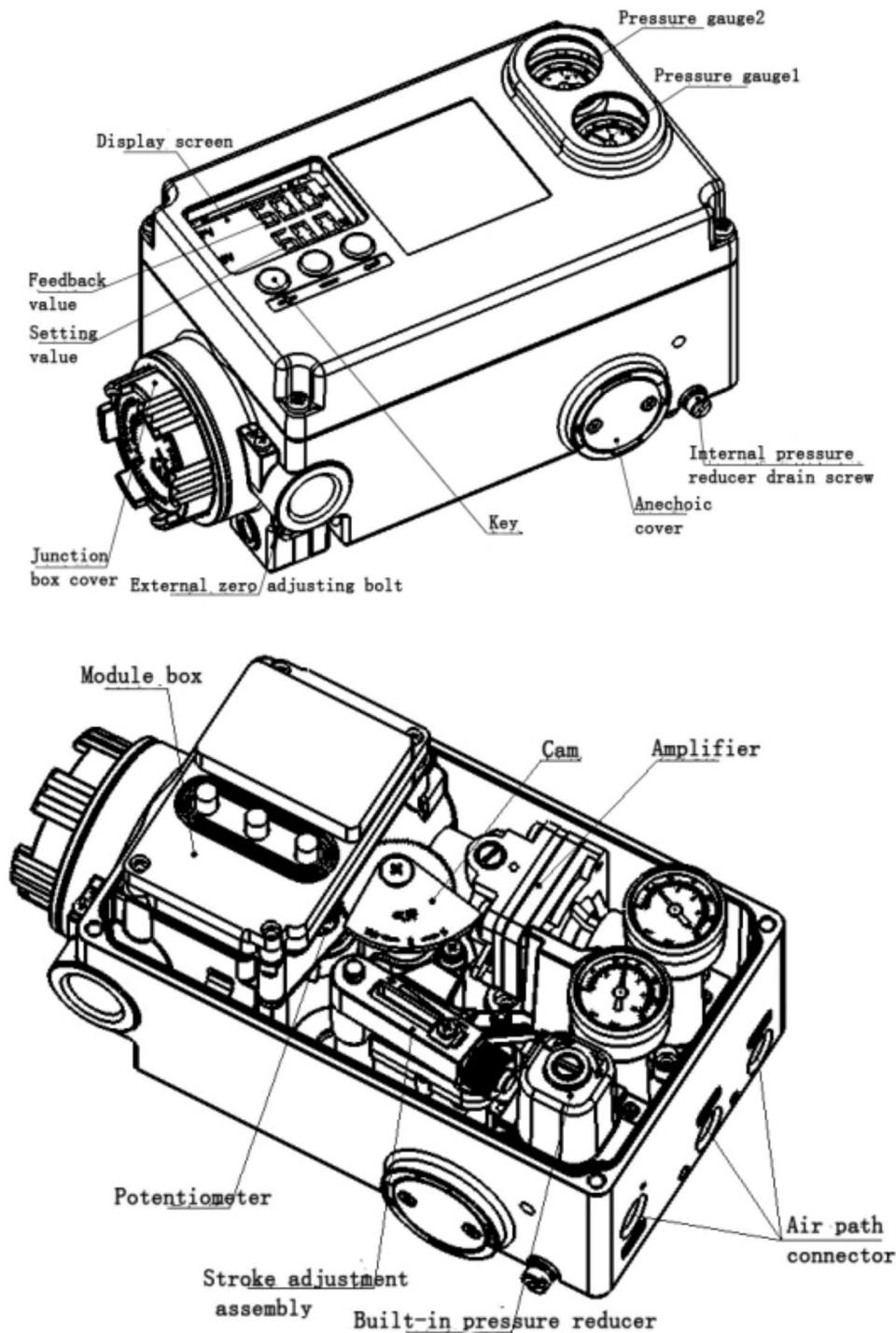
Changshu Weitelong Automatic Instrument Factory

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Product Introduction

L8A-100 electric valve positioner is a device that receives 4 ~ 20mA DC signal control and precisely adjusts the valve opening through pneumatic actuator. The positioner is equipped with an air filter pressure reducer to display the opening (percentage) of the valve position and output feedback signal (4 ~ 20mA). The compressed air of the pressure of 5~10kgf/cm² can be directly connected to the "SUP" input interface of the positioner.



Precautions

Note	For the safety of installation personnel, products and systems, please observe the safety precautions in this manual when installing or commissioning this product.
	Improper modification or repair of the product may cause damage. Please contact us if you need to repair or modify this product.
	This product is an accessory of control valve. Please observe the operation precautions of corresponding control valve at the same time during operation.

- Please handle with care during transportation, installation and use. Excessive vibration and impact may damage the product.
- Do not use beyond the scope of product technical parameters.
- Do not store products in high temperature and high humidity environment for a long time. When using, it should be covered to prevent rainwater from entering into the product.

Warranty period

The warranty period of the product is subject to the date of manufacture with a warranty period of 1 years.

Technical parameters

Table 1

Items	L8A-100L		L8A-100R	
	Single acting	Double acting	Single acting	Double acting
Input signal	4~20mA DC			
Impedance	250±15Ω (model without feedback)			
Supply pressure	1.4~7.0kgf/cm ² (20~100psi)			
Stroke	10~150mm		0~90°	
Air source interface size	PT(NPT) 1/4			
Pressure gauge interface size	PT(NPT) 1/8			
Power supply interface size	PF 1/2 (G 1/2)			

Protection level		IP65			
Ambient temperature	Working temperature	Standard model: -20~70℃ Low temperature model: -40~70℃ (no indication below -20℃)			
	Explosion proof temperature	-20~60℃			
Linearity		±1.0% F.S			
Hysteresis		1.0% F.S			
Sensitivity		±0.2% F.S	±0.5%F.S	±0.2% F.S	±0.5% F.S
Repeatability		±0.5% F.S			
Air consumption		3LPM (Sup=1.4kgf/cm²,20psi)			
Flow		80LPM (Sup=1.4kgf/cm²,20psi)			
Material		Die casting aluminum			
Weight		2.5kg		2.5kg	
Model with number display function/feedback function					
Input signal		4~20mA DC (two-wire system)			
Input load voltage		MAX 15V			
Feedback signal		4~20mA DC (two-wire system)			
Feedback signal power		DC 24V±15%			

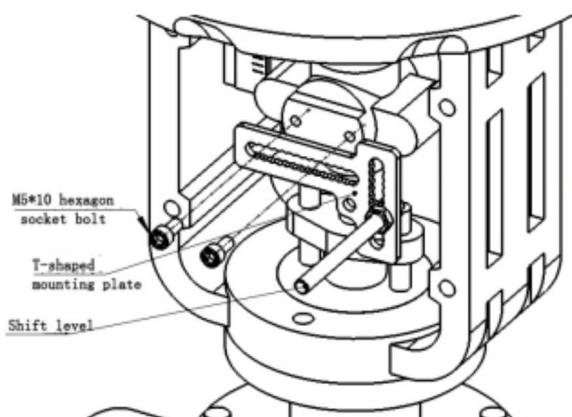
Installation

Mechanical connection

Precautions

Note	Before installation, the input signal and air source of valve, actuator and other accessories shall be cut off.
	If the regulating valve has been installed in the pipeline, measures should be taken to isolate the regulating valve from the pipeline.

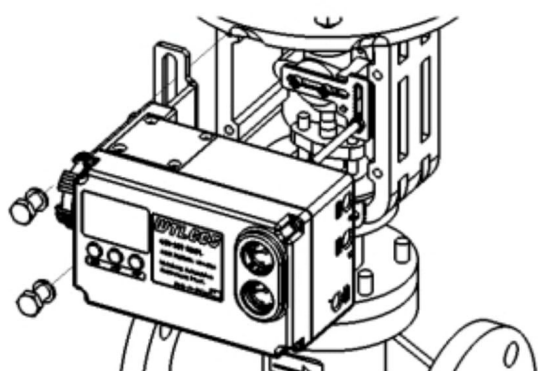
Install to linear motion actuator



Installation of mounting accessories

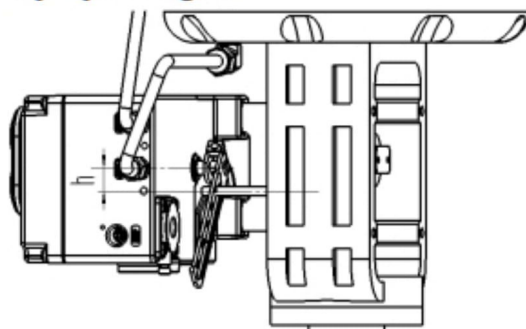
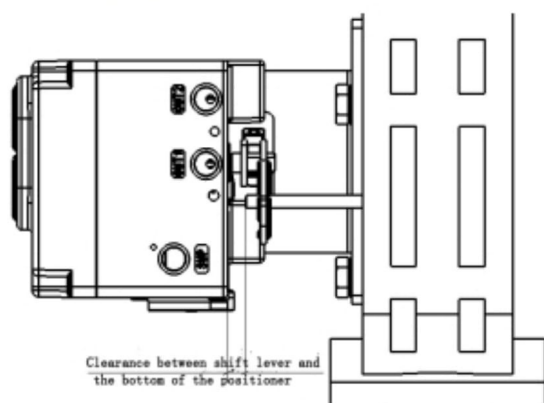
1. Take out the positioner and mounting accessories from the box;
2. Fix the T-shaped plate on the valve stem with two M5 bolts as shown in the left drawing.
3. Fix the shift lever in the T-plate groove with two nuts provided.

Installation of positioner



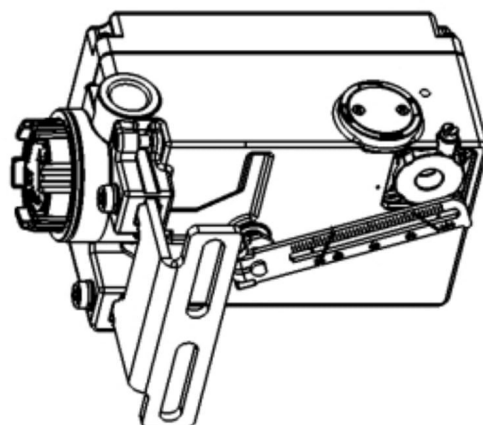
1. Place the positioner together with the mounting plate on the valve, align the kidney-shaped groove of the mounting plate with the two bolt holes on the valve mounting frame, and fix it with two M10 external hexagon bolts. Bolts need not be tightened. Tighten the bolt after the positioner is installed and adjusted to the proper height.

2. Place the shift lever in the feedback rod groove of the positioner, and the gap between the shift lever and the bottom of the positioner shall not be less than 5mm.

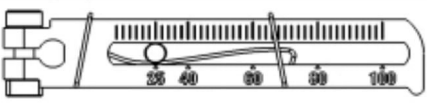
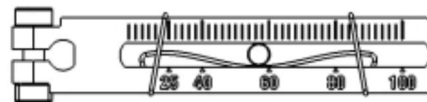
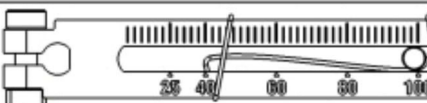


3. Adjust the relative position of the mounting plate and the shift lever according to the stroke of the actuator, so that the vertical distance h between the feedback shaft of the

positioner and the shift lever is about half of the actuator stroke. Then tighten the nuts.

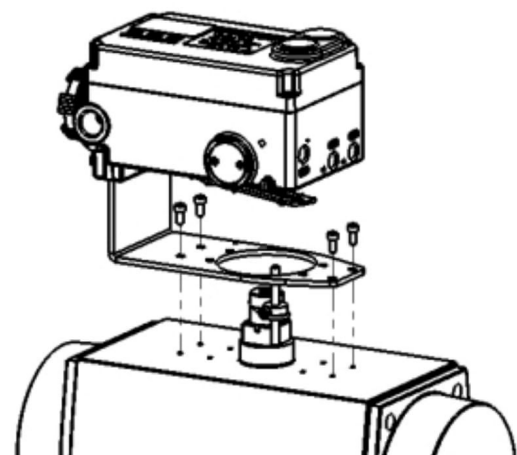
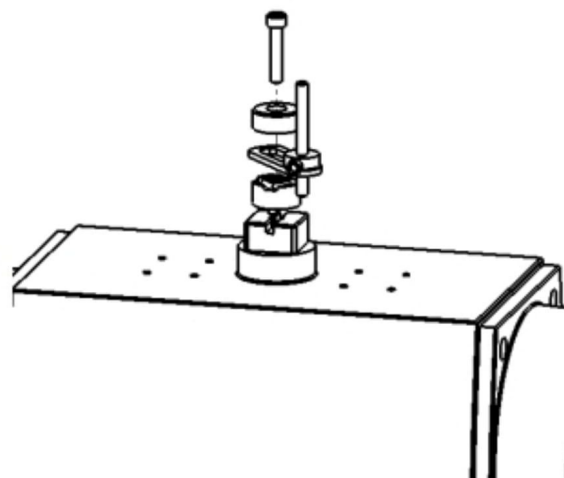


Note: In order to improve the positioning accuracy, please refer to the table below for the left and right positions of the shift lever in the feedback lever groove when installing the linear motion actuator (the relative positions can be adjusted by moving the "T-shaped plate" left and right and installing the mounting plate reversely)

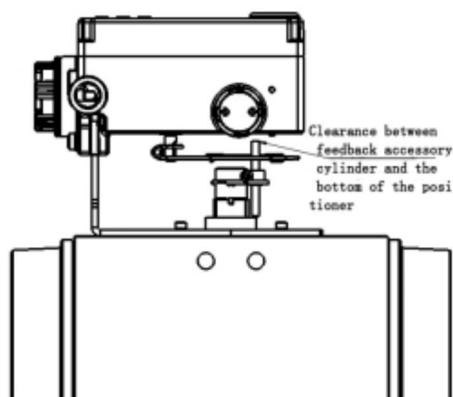
Stroke of actuator	Position of the shift lever in the feedback rod groove
Below 25	 Place the shift lever at the scale of 25
25~100	 Place the shift lever at the scale of 25~100
100 and above	 Place the shift lever at the scale of 100

Install to rotary motion actuator

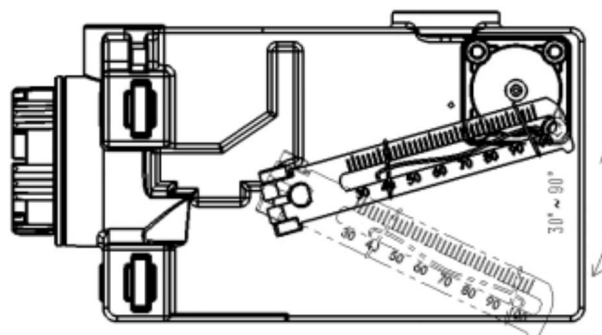
1. Fix the mounting accessories to the cylinder.
2. Place the positioner with the mounting plate on the air cylinder, install it as shown in the figure, and place the shift lever in the feedback rod groove.
3. Adjust the height of the shift lever to keep a distance of more than 5mm from the bottom of the positioner, and adjust the horizontal extension length of the "8" shaped plate of the fixed shift lever to make the shift lever close to the middle of the feedback rod groove.



4. Tighten all mounting screws



To obtain the optimized effect, the swing of feedback rod should be between $30^{\circ} \sim 90^{\circ}$ when the valve is fully opened.



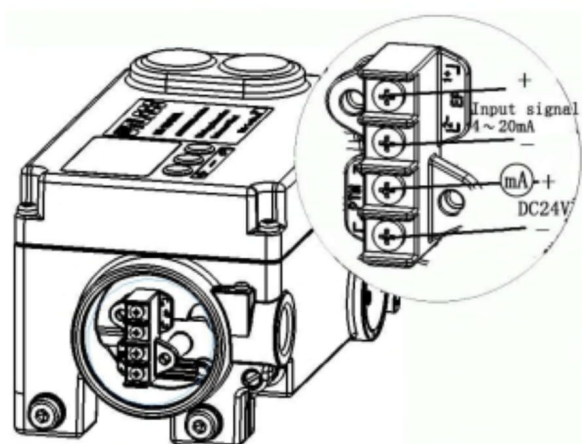
Electrical connection

Precautions

Note	The rated working voltage of the positioner is 24v and the maximum working voltage is 26v. Working in excess of rated voltage for a long time may cause unexpected conditions.
	The feedback signal is in an unstable state when the positioner has no signal. Do not use feedback signals as key interlock signals.

Connection method of signal line and feedback line

Connection of signal line



1. EP "+" terminal is connected with the positive pole of PLC (DCS) 4-20mA output signal, and EP "-" terminal is connected with the negative pole of the output signal.
2. Suitable for $0.5 \sim 1.5\text{mm}^2$ cable.

Connection of feedback line

1. The two PTM terminals are respectively connected with the positive and negative poles of the feedback signal circuit, and the poles of the two terminals do not matter.
2. Suitable for $0.5 \sim 1.5\text{mm}^2$ cable.

Piping

Note	Make sure to open the compressed air source after the pipeline is connected to prevent accidents
	When the compressed air source is opened, the regulating valve may act to ensure that the gas source is opened after confirming the safety of the site and pipeline.
	The compressed air source after drying, degreasing and dedusting shall be used.

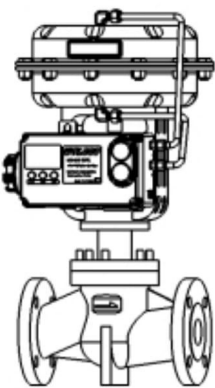
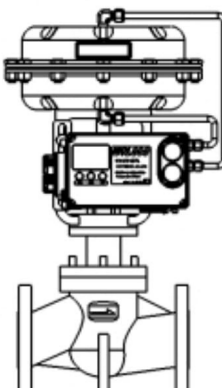
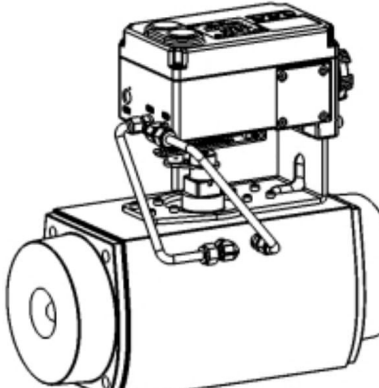
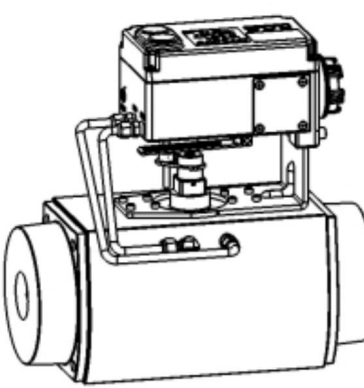
Note: The positioner is the air-to-open valve (reverse action) by default. When it is installed on the air-to-open valve, it is directly connected to the air pipe; when it is installed on the air-to-close valve, the cam should be turned over according to the column of air-to-close valve of "Table 3".

Pipe connection between positioner and actuator

1. When installed on the single acting actuator, connect the actuator with "OUT1" port, and block "OUT2" with a plug.
2. When installed on the double acting actuator, use "OUT1" and "OUT2" ports to connect the two input ports of the actuator.
3. "Sup" port is connected with air source input.

Piping connection of actuator

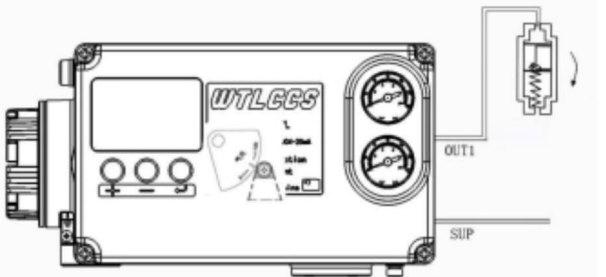
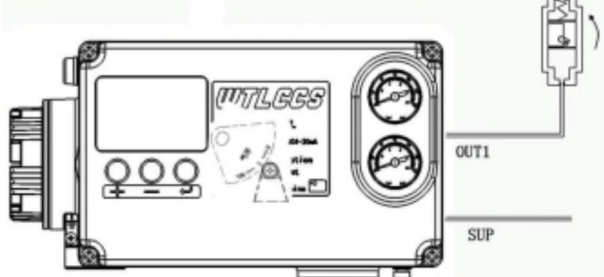
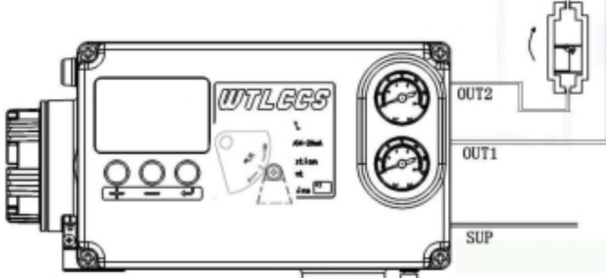
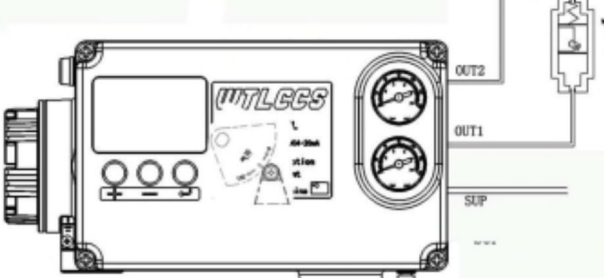
Table 2

air-to-open (reverse action)	air-to-close (direct action)	air-to-open (reverse action)	air-to-close (direct action)
			

Determine the cam surface according to the action mode of the actuator

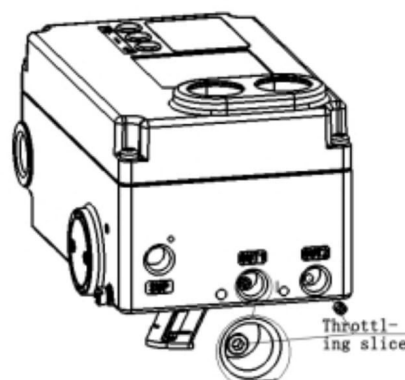
After the positioner is installed on the actuator, when the actuator is single acting, the "air off" surface or "air on" surface of the cam can be determined according to the rotation direction of the feedback rod of the positioner when the output port of the positioner "OUT1" is output. If it is a double acting actuator, the cam surface can also be determined according to the rotation direction of the feedback rod of the positioner when the "OUT1" is output.

Table 3

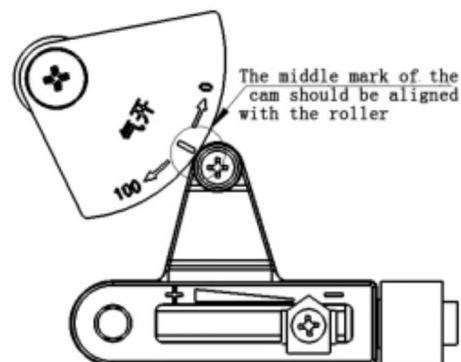
air-to-close(direct action)	air-to-open (reverse action)
	
	

Throttling orifice adjustment

When assembling the small volume actuator, the throttling slice can be installed at the output port of the positioner or throttling joint can be used to avoid the oscillation. It is not provided by default when ex-factory, and it shall be specified when ordering if it is needed.



If the cam need to be turned over, just screw off the "locking bolt", reverse and install the cam on the shaft, then tighten the "locking screw", and change the air path

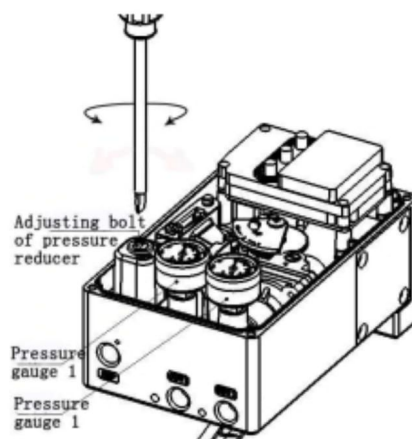


of "OUT 1" and "OUT 2". After the cam is installed, when the actuator opening is about 50%, the middle mark of the cam should be aligned with the roller.

Commissioning

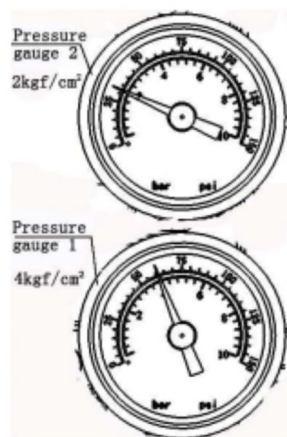
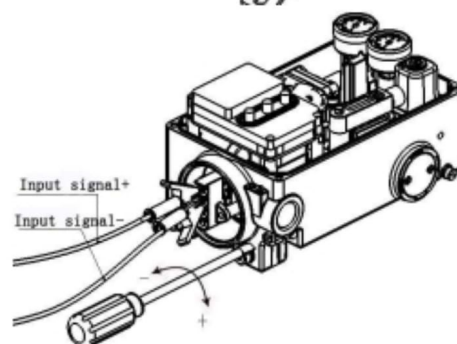
Adjust the pressure of reducer pressure

Uncover the positioner, adjust the adjusting screw of the pressure reducer with a slotted screwdriver, and adjust the pressure of pressure gauge 1 to the nominal pressure of actuator.



Zero adjustment

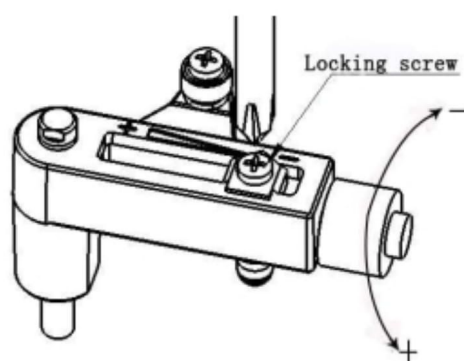
1. Connect the signal input line, preset a 4mA (0%) signal, use a slotted screwdriver to slightly rotate the zero adjustment screw. adjust clockwise as the direction in the figure then the zero position rises; otherwise, it will drop;
2. If the actuator is single acting, adjust the zero adjusting bolt clockwise to give pressure to the pressure gauge 2. After the valve acts slightly, screw the zero adjusting bolt anticlockwise to return the pressure of pressure gauge 2 to zero; and the valve returns to its initial position.
3. If the actuator is double acting, adjust the zero adjusting bolt clockwise to rise the pressure of pressure gauge 2 to the nominal pressure of valve, and then adjust the zero adjusting bolt anticlockwise to make the pointer of pressure gauge 2 point to 1/2 of the nominal pressure of the valve.



For example, the range pressure of the actuator is 4kgf/cm², then adjust it as shown in the right figure

Stroke adjustment

Preset 20mA(100%) signal to see whether the actuator is fully opened.

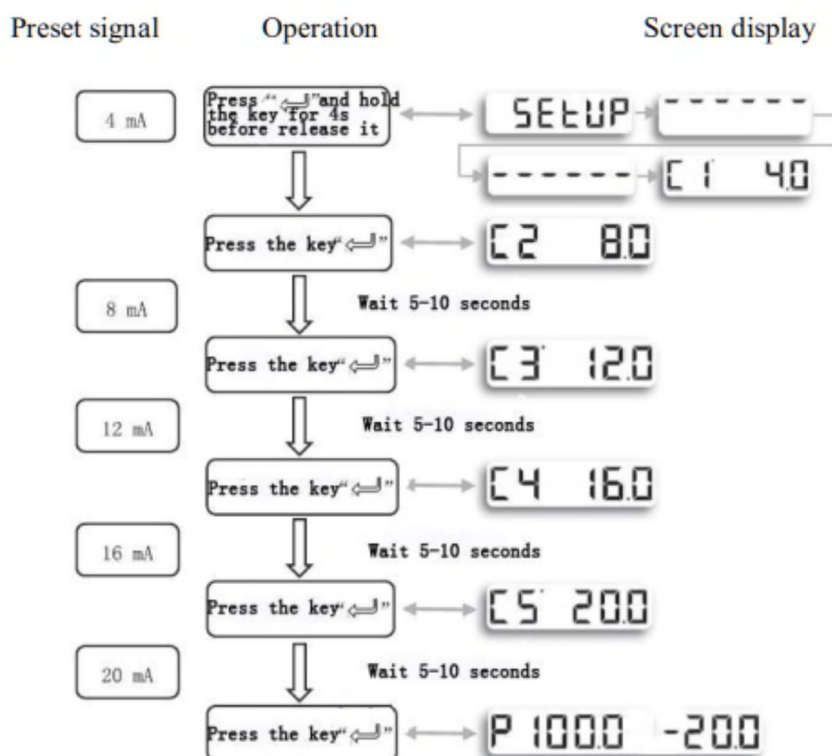


1. If it is fully opened, reduce the input signal to 19mA to see whether the valve acts. If the valve does not act, it indicates that the stroke is too long. Loosen the locking screw on the travel frame with a cross screwdriver, rotate the stroke adjustment handwheel in the “-” direction for about 2 ~ 3 circles. Tighten the cross screw, preset a signal of 4mA and adjust zero position again. Then preset 20mA and 19mA signals successively until the preset 20mA valve is fully opened; reduce the signal input until the 19mA valve acts;
2. If the 20mA valve is not fully opened, then loosen the locking screw on the travel frame with a cross screwdriver, rotate the stroke adjustment handwheel in the “+” direction for about 2 ~ 3 circles. Tighten the locking screw and adjust the zero position again. Then preset 20mA and 19mA signals successively until the preset 20mA valve is fully opened; reduce the signal input until the 19mA valve acts; the stroke is adjusted and restore the cover.

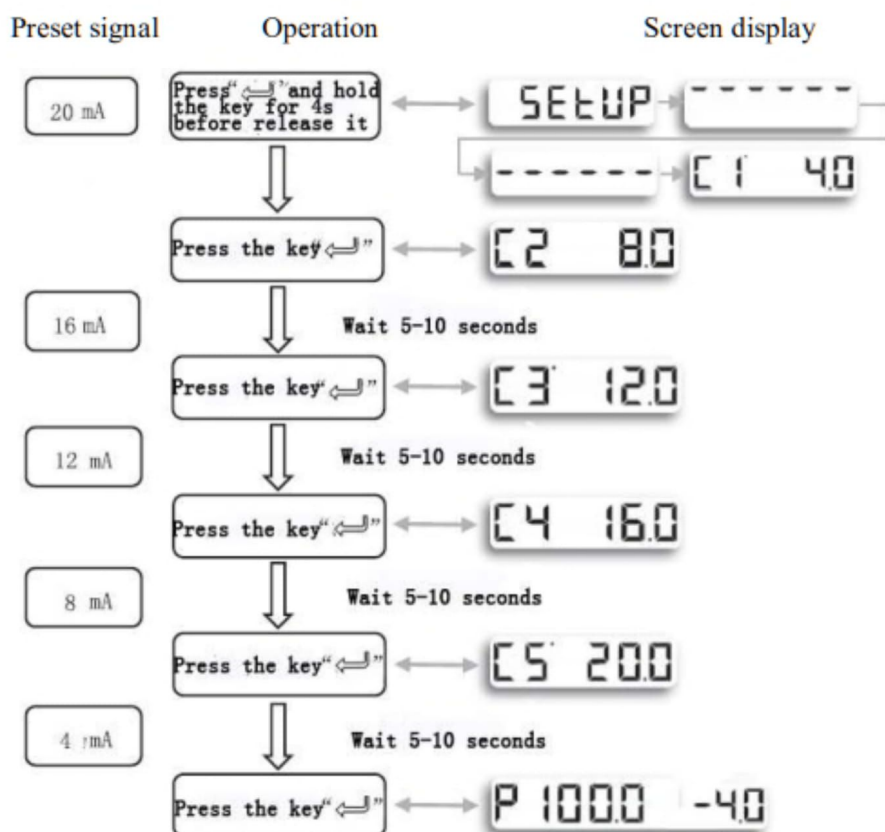
Feedback calibration

Connect the signal line and feedback line

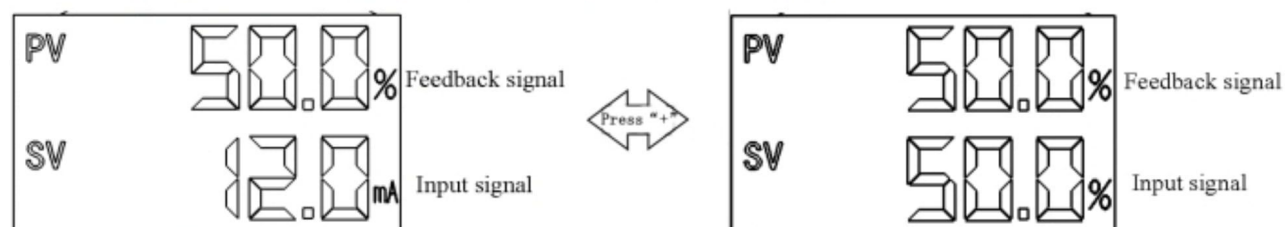
1. Adjust feedback signal in the following steps



2. If the input signal shall be opposite to the feedback signal, set it in the following steps



The display screen is input and output dual display



Press "+" to switch the display mode of input signal

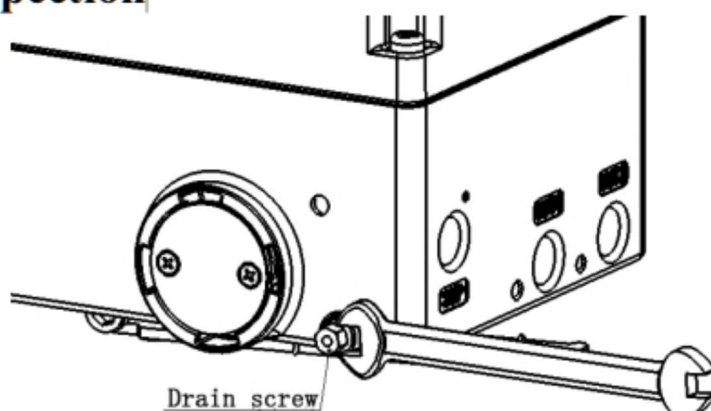
Product maintenance and inspection

1. Regularly check the output pressure of the air filter pressure reducer of the valve positioner. Do not increase or reduce the output pressure of the pressure reducer at will.

2. Regularly drain the air filter pressure reducer to prevent the water vapor in

the pressure reducer from entering into the positioner and cause the positioner failure. When draining water, turn the drain screw 2 circles anticlockwise, and then tighten the screw.

3. In normal use, please cover the shell of the positioner to prevent water vapor, dust and



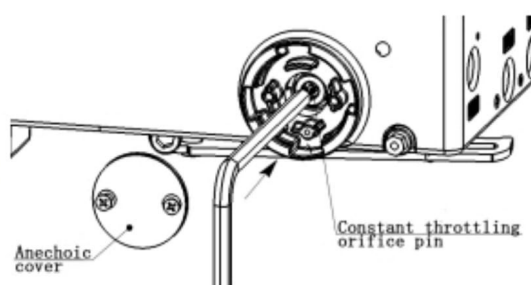
other impurities from entering the positioner to cause failure.

Common troubleshooting

No action of preset signal	Check the air supply Check the signal connection
It acts but cannot be fully opened (closed)	Check the air supply pressure.
It can only be fully opened or fully closed	Clear constant throttling orifice
Positioner oscillation	Check whether the connecting accessories are loose Check the output port for leakage Small volume of the actuator
No feedback signal	Check the feedback signal connection Check the 24 V power supply of feedback signal circuit
The LCD displays as Error	Check whether the feedback rod is loose Check the potentiometer gear for looseness Potentiometer and gear not aligned or damaged poor contact of potentiometer wire

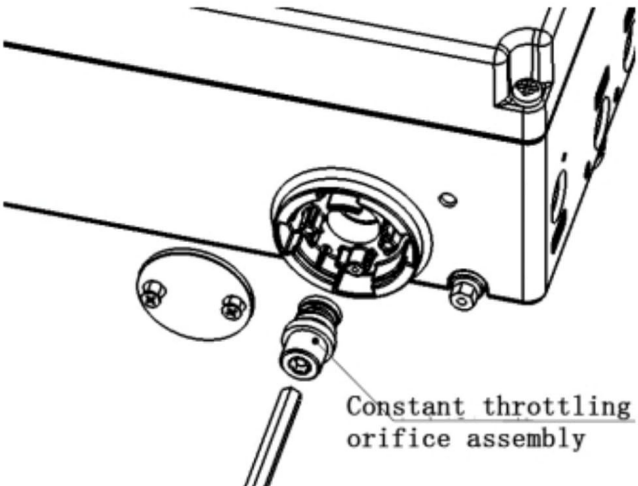
Clear constant throttling orifice

1. Open the anechoic cover on the side and press down the pin several times with a hexagon wrench or other tools below 5mm to clear the "constant throttling orifice".

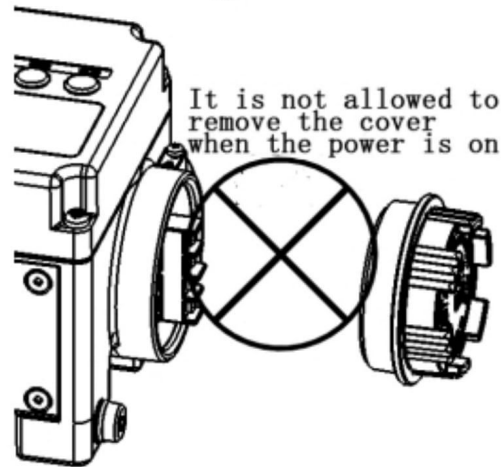


2. If it cannot be cleared, turn off the air source, screw out the constant throttling orifice assembly with a 5mm hexagon wrench, open the air source to purge the internal air path of the positioner, and then turn off the air source. Apply lubricating oil on the

thread of the constant throttling orifice assembly, screw it back to the original position. Do not forget the sealing O-ring when installing.



Warning:



1. Do not adjust the amplifier "balance adjusting screw".
2.The junction box can be uncovered only after the power is cut off.

Ordering instructions

Ordering code

L8A-100 1 2 3 - 4 5

1 Travel type	L Linear	4: Additional functions PL with LCD display, 4~20mA signal feedback 5 : pressure relief valve
	R Rotary	
2 Output	S Single	
	D Double	
3 Structure	I Installation Ex iaII CT6	
	M Explosion proof Ex dII CT6	
	N Normal Non explosion proof	

Contact the factory for customized products.