MAXONIC®
automation control

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MVP

Intelligent Electropneumatic Valve Positioner

User Manual

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1 Information for Customers

1.1 Safety guide

1) Turn on the power supply before air is supplied;
2) Don't touch the positioner during operation;
3) This product must be correctly installed, operated and maintained.

1.2 Packing list

1) MVP intelligent valve positioner;
2) Standard connecting fittings;
3) User manual;
4) Optional parts.

1.3 Important information tips

In order to enable you to better use this manual and ensure your safety during commissioning, operation and maintenance of the equipment, please understand the meaning of the following symbols:

Symbol	Word	Explanation
⚠	Caution	Caution means a potential danger. If it doesn't is avoid, it may result in damage of the product or surrounding objects. (Dangerous materials)
i	Precaution	Precaution means any thing that is useful or in case of negligence, it would affect the operating conditions or product functions. (Not including a dangerous or harmful situation.)

Please read this manual carefully before installation and commissioning.

2 General

MVP intelligent electropneumatic positioner is an intelligent 2 - wire field instrument developed by Shenzhen Maxonic Automation Control Co., Ltd. As an associated device of the pneumatic valve, the positioner is widely used in automatic control systems of petroleum, chemical, electric, metallurgic and light industries.

MVP intelligent valve positioner receives 4-20mA valve position setting signals from the automatic control system and obtains valve position Setpoint via A/D conversion; meanwhile, it gets actual valve position signals via the position sensor, the two of them are processed by the control software to control air inlet and outlet of the pneumatic actuator and drive the valve position to reach the set point (as shown in Fig.1).

MVP intelligent valve positioner is a high performance electric/pneumatic valve positioner based on microprocessor technology. It can eliminate friction and imbalance force on the valve core and enhance responding speed of the regulating valve so as to make it position fast and exactly . It cannot only completely substitute traditional electric/pneumatic valve positioner but also is able to directly connect with the HART protocol network, thus realizing information exchange with the control system.

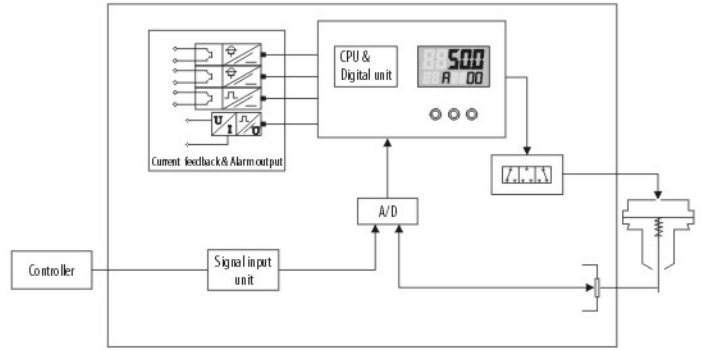

Fig.1 Schematic diagram of MVP intelligent valve positioner

2.1 Function Introduction

- Automatic initialization function: Automatically search valve's zero point and fullness, optimize valve control parameter and improve control precision.
- Configuration function: It can set valve's characteristic curve, moving mode, dead band, stroke range, shutdown value and event output.
- Self-diagnostic function: It can register and display the over-adjusted amount of the signal, interruption of the input signal and interruption of the valve signal.
- Communications function: Communications function of Hart protocol.
- Current feedback function: Output 4-20mA DC valve position feedback signal.

2.2 Features

- High control accuracy, up to 0.5% FS.
- Operation without opening the cover and convenient operation and adjustment.
- With essential safety explosion-proof performance that is safe and reliable.
- It is of simple and compact structure and can be installed on small actuators.
- Automatic initialization and diagnosis, valve's characteristic curve can be configuration.
- Few mechanical parts and fine anti-vibration performance.
- It can set parameters locally or remotely.
- Low power consumption, low air consumption and low running cost.
- Use a 2-wire 4-20mA standard signal.

3 Technical Parameters

Input signal	4~20mA, 2-wire system
Stroke	linear 10~100mm, rotary 0~90°
Air supply	0.14—0.7Mpa
Accuracy	0.5% FS
Hysteresis	0.2% FS
Dead band	0.1% FS
Input impedance	375/20mA
Output characteristics	Linearity, equal percentage, quick-open or user-defined
Ambient temperature	-20～+70℃
Ambient humidity	5%～95%RH
Atmospheric pressure	86～106KPa
Explosion Approval	EEx ia IIC T4-T6
Explosion proof class	Intrinsically safe
Electrical connections gland	M20X1.5
Pneumatic connections	G 1/4, 1/4 NPT
Weight	About 2 kg
Degree of housing protection	IP65

4 Installation Description

4.1 Enclosure dimension (mm)

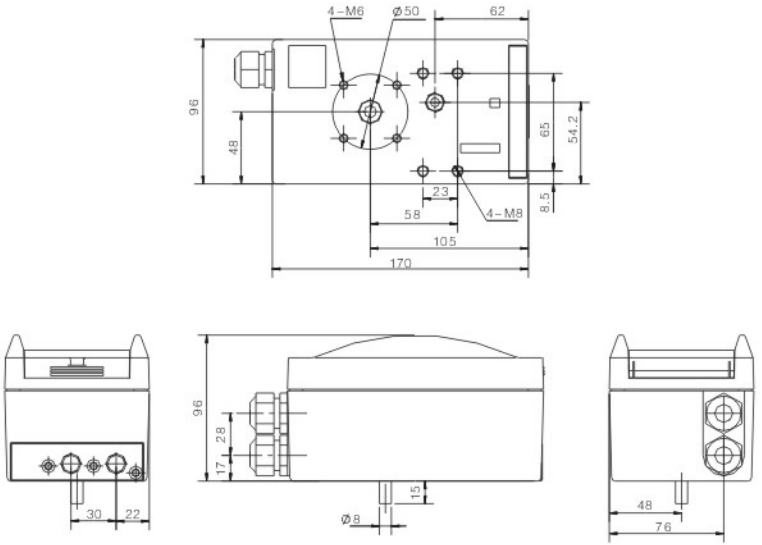

Fig.2 MVP intelligent electropneumatic valve positioner dimensional drawings

4.2 Mechanical mounting

4.2.1 Mounting to linear actuators

Installation steps are as follows (see Fig.3)

1) Fix positioner's connection board 5) on the positioner seat by means of the hexagonal head bolt 1) with gasket 3) and spring washer 2).
2) Fix actuator's connection board 4) on the actuator by means of the hexagonal head bolt 3) with gasket 3) and spring washer 2).
3) Fix central connecting block 14) on the actuator by means of the internal hexagonal screw with gasket 13) and spring washer 12).
4) Fix U-type follower guide 9) and clamping block 10) on the central connecting block by means of the hexagonal-head screw 6) with gasket 7) and spring washer 8).
5) Fix the feedback lever 15) on positioner.
6) Fix and connect the positioner's connecting board with actuator's connecting board by means of hexagonal head bolt 1) with gasket 3) and spring washer 2).

Caution:

1. When mounting on actuator, it should avoid the bracket from jamming the vent at the bottom of positioner.
2. At completion of the installation, check whether the actuator's operating range conforms to the range of the positioner sensor.

Table for mounting kit

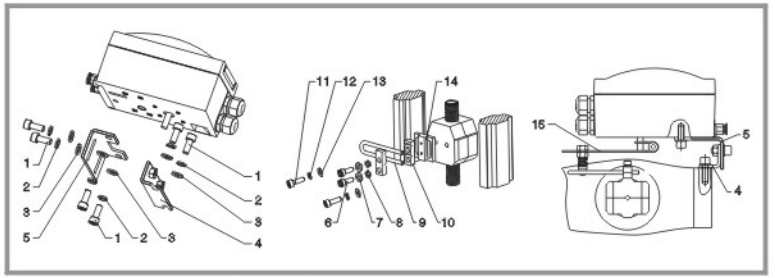

Fig.3 Installation of Linear valve positioner

No.	Qty.	Name	Specifications
1	6	Hexagonal head bolt	M8 x 16
2	6	Spring washer	D8
3	6	Gasket	D8
4	1	Actuator's connecting board	
5	1	Positioner's connecting board	
6	2	Internal hexagonal round-headed screw	M6 x 25
7	2	Spring washer	D6
8	2	Gasket	D6
9	1	U-type follower guide	
10	2	damping block	
11	2	Internal hexagonal round-headed screw	M5 x 16
12	2	Spring washer	D5
13	2	Gasket	D5
14	1	Central connecting block	
15	1	feedback lever	

4.2.2 Mounting to rotary actuators

Installation steps are as follows (see Fig.4):

1) Fix the bracket on the positioner seat by means of the internal hexagonal round-headed screw 7) with gasket 4) and spring washer 5).
2) Fix positioner's connecting part 8) on the positioner with fixing screw 9).
3) Put the bottom clamping block on the actuator, and fix the U-type follower guide 2) on the bottom clamping block by means of the internal hexagonal round-headed screw 6) and clamping block with gasket 4) and spring washers 5).
4) Carefully place the positioner with the mounting frame on the actuator and make U-type follower guide correctly bush the sliding block of the connecting part. Adjust the positioner and fix the bracket on the actuator by means of the hexagonal round-headed screws 11) with gasket 13) and spring washer 12).

Table of rotary stroke installation parts

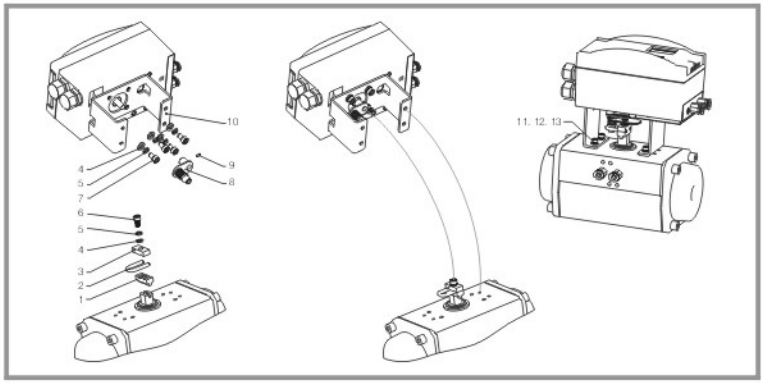

Fig.4 Installation of Rotary valve positioner

No.	Qty.	Name	Specifications
1	1	Bottom damping block	
2	1	U-type follower guide	
3	1	Clamping block	
4	5	Gasket	D6
5	5	Spring washer	D6
6	1	Internal hexagonal round-headed screw	M6 x 25
7	4	Internal hexagonal round-headed screw	M6 x 16
8	1	Positioner's connecting part	
9	1	Fixing screw	M6 x 6
10	1	Bracket	
11	4	Internal hexagonal round-headed screw	M5 x 16
12	4	Spring washer	D5
13	4	Gasket	D5

Caution:

1. When mounting on actuator, it should avoid the bracket from jamming the vent at the bottom of positioner.
2. At completion of the installation, check whether the actuator's operating range conforms to the range of the positioner sensor.

4.3 Pneumatic connection

All pneumatic piping connction are located on right side of the positioner. There are two types of air joint thread G1/4 and 1/4NPT (it should declare on order). See notes on the product for corresponding thread type. user can make own choice according to different pipeline connections.

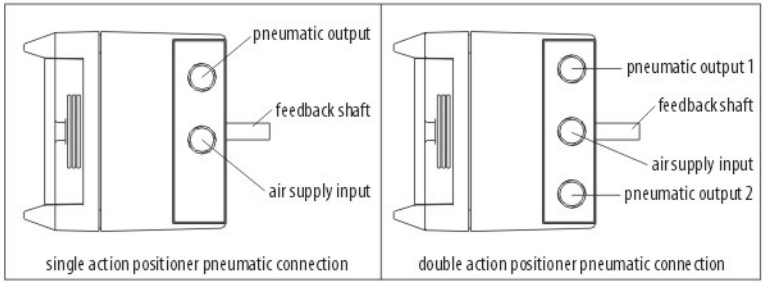

Fig.5 Diagram for pneumatic connection

Connecting steps are as follows:

1. Connect the output of the positioner with the input of the pneumatic actuator according to Fig. 5.

Caution:
No any air leakage is allowed at the joint and check the tightness of the joint with soap water.

2. Connect the input of the positioner with the air source. Compressed air flowing into the positioner must be filtered and stabilized through air filter reduction valve.

Requirements for air supply:

a) Air supply pressure should be 0.14~0.7Mpa, but concrete value depends on actuators.

b) Air supply must be of clean and dry air free from apparent oil vapor, oil and other liquids.

c) Air supply must be free from obvious corrosive air, vapor and solvent.

d) Amount of solid particles in the air source shall be less than 0.1g/m^3, particle diameter shall be smaller than 60 μm and oil content shall be less than <10 mg/m^3.

e) Air supply's dew point under the working pressure shall be at least 10℃ lower than that of the operating ambient temperature of the positioner.

4.4 Electrical Connection

4.4.1 Input signal electrical connection (see Fig. 6)

Type: 2-wire

Input signal: 4~20mA

Min. working current: 3.6mA.DC

Input impedance: 350 Ω (no HART)

550 Ω (HART type)

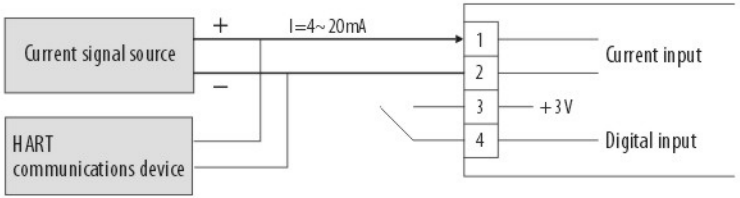

Fig.6： Diagram for electrical connection of signal input

4.4.2 Electrical connection of the alarm module

Working voltage: U=18~35 V DC

Alarm current: I≤1.0mA, logical OFF

I≥2.1mA, logical ON

Applied resistance: 1k Ω

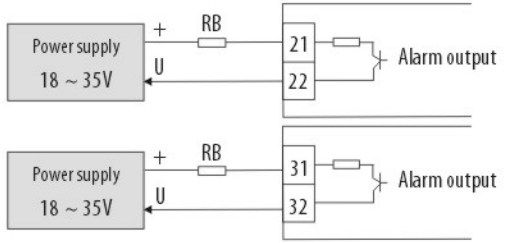

Fig 7： Electrical connection of alarm module

4.4.3 Electrical connection of feedback output module (see Fig.8)

Feedback signal type: 2-wire system, 4~20mA

Temperature drift: ≤100ppm/ ℃

Working range: 3.6 ~ 20.5 mA

Accuracy: ≤0.1%FS

Supply voltage: 20 ~ 30V

Applied resistance: RB≤(U-20)/Imax; (RB by K Ω ; U by V; I by mA)

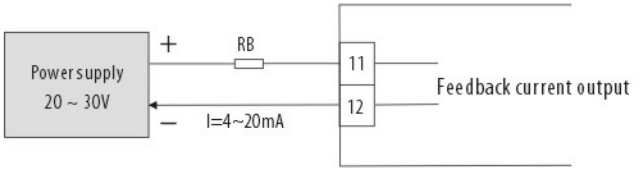

Fig.8： Electrical connection of feedback output module

4.4.4 Microswitches electrical connection (see Fig.9)

Input voltage: Ui≤24V DC

Input current: Ii≤2A

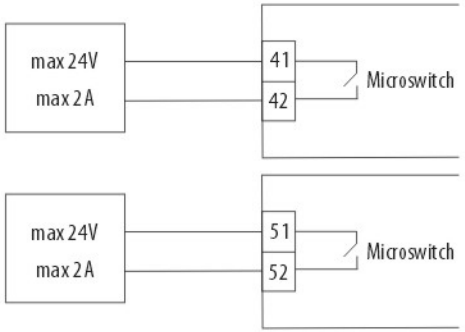

Fig.9 Microswitches electrical connection

4.4.5 Requirements for electrical connection:

All the electrical connections should be made strictly according to the connecting diagram, which shall be reliably fixed without any looseness.

When using the MVP intelligent valve positioner, its installation and operation shall comply with relevant regulations of the state, meanwhile, it shall pay attention to the following points:

1. The equipped safety barrier shall have essential safety explosion-proof certification.
2. The safety barrier should be reliably grounded, whose grounding resistance shall be as small as possible. Grounding terminal shall be equipped with relaxing device and anti-rust treated.
3. Connecting cable shall be equipped with essential safety explosion proof, its sectional area shall be at least 0.5 mm^2 and the protection sheath should be grounded at the safety area. The maximum permissible capacitance shall not exceed 0.06 μF and inductance shall not exceed 1mH.

5 Adjustment

5.1 Operating interface description

Display: LCD displays in two lines.

At the normal operation mode:

The first line displays the valve position value.

From the left to the right in the second line are valve moving direction, operating mode and control input value.

At the parameter setting mode:

The first line displays the control parameter value.

From the left to the right in the second line are parameter series number and code parameter.

> **Caution:**
> When the positioner's operating ambient temperatures is lower than -10℃, LCD will display slowly.

Keys: There are three keys on positioner. As shown in Fig10:

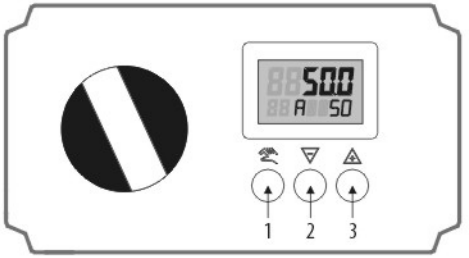

Fig.10 Operating interface

Upper line:

Normal operation mode:

Displays the valve position feedback value.

Parameter setting mode:

Displays the control parameter value.

Valve position indicator.

Nether line:

Normal operation mode:

From the left to the right are valve moving direction, operating mode and control input value.

Parameter setting mode:

From the left to the right are parameter series number and code parameter.

Function key:

Normal operation mode:

Press this key, manual / auto control switch over.

Keep this key press over 10seconds, enter user menu.

Parameter selection mode:

Press this key, choose parameter P1/P2/P3/P4

Press this key, change menu parameter modification mode

Keep this key press over 10 seconds, quit user menu

Increase key:

Normal operation mode:

In manual controlling, press this key, valve position value increase; keep this key press, then press ▽ key, increase fast.

Parameter setting mode:

Press this key, it will choose parameter upwards

In parameter modifying, it's be value increase key.

Decrease key:

Normal operation mode:

In manual controlling, press this key, valve position value decrease; keep this key press, then press △ key, decrease fast.

Parameter setting mode:

Press this key, it will choose parameter downwards

In parameter modifying, it's be value decrease key.

Precaution: 1. Manual/Auto switchover

Automatic mode switches over to manual mode: press the key " ", LCD's second line displays "A".

Manual mode switches over to automatic mode: press the key " ", LCD's second line displays "M";

2. Manual control:

At the manual mode, press key "△", valve's openness increases and press key "▽" at the same time, valve's openness increases fast.

At the manual mode, press key "▽", valve's openness decreases and press key "△", valve's openness decreases fast.

5.2 User menu

5.2.1 Login user menu

At the normal interface, keep the key " " pressed for 10 seconds, it can login the user menu.

5.2.2 Selection of user menu

At the selection mode of the user menu, parameters that can be selected are divided into 4 kinds: P1, P2, P3 and P4.

Changeover of the 4 kinds of parameters: when LCD displays any one of P1, P2, P3, P4 on the upper line, press key " ", it can circularly select any one of the parameters. (As shown in Fig.11)

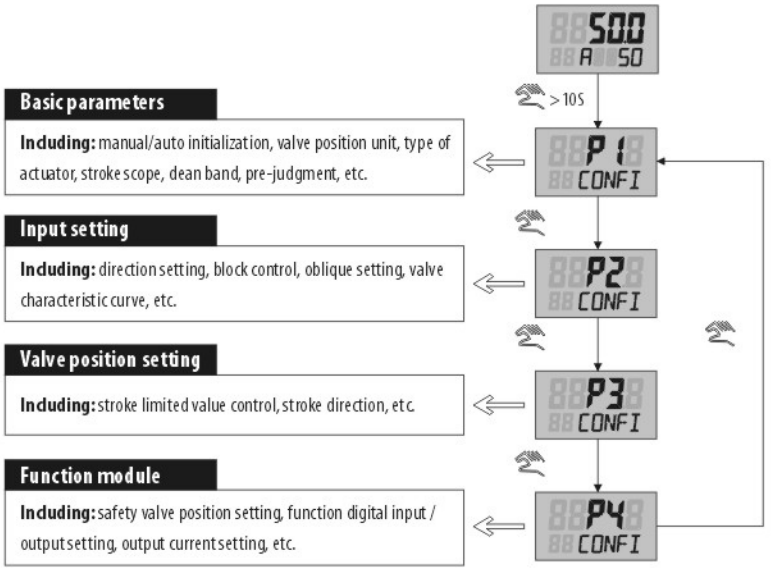

Fig.11 Selection of user's menu parameters

Selection of each kind of parameter:

Press key "▲" , menu pages upward circularly

Press key "▼" , menu pages downward circularly

At this moment, the upper line displays parameter;

The Nether line displays two digits that are parameter series in front two number and digits behind is parameter name.

5.2.3 Revision of user menu

Press key "✋" , enter menu revising mode, parameter name begins flickering on the screen at this moment.

Example:

For numerical parameters:

Press key "▲" , parameter value increases. When it holds the key "▲" pressed, parameter value increases fast.

Press key "▼" , parameter value decreases. When it holds the key "▲" pressed, parameter value decreases fast.

For character parameters:

Press key "▲" , select forward parameter.

Press key "▼" , select backward parameter.

For resetting PRST, automatically initiation INIA and manually initiation INIM.

Hold the key "▲" pressed, it displays "STRT" on the first line, and enter it's own mode in 10 seconds.

After "PRST" resetting is completed, the first line displays feedback value and the second line displays the flickering "NOINI", which means it is not initialized.

Example:

Important:
At the menu mode, the valve positioner returns to operating mode in case of no operation made in 1min.

5.2.4 Quit user menu

At user menu selection mode:

Hold the key "" pressed over 10s, it will quit the use menu mode and return to normal operation mode.

5.3 Commissioning

At the completion of the installation of the valve positioner, it must be initialized. The valve will be automatically turned off when commissioning starts. In order to ensure that valve's ON and OFF will not affect the process and personal safety , it shall check the operating conditions and take necessary protective measures.

Electrical connections of positioner and actuator should be checked before commissioning. After power is turned on, it shall make necessary preparations and then start commissioning. There are two kinds of method for commissioning: automatic initialization and manual initialization.

5.3.1 Commissioning preparation

First, it shall ensure that position feedback stroke value or rotating angle is correct. The maximum rotating angle fitted on the rotary actuators is 90° . In order to guarantee a correct operating scope in linear actuators, when feedback lever is located in the middle of the stroke, feedback lever and U-type follower guide shall be parallel on the plane direction.

5.3.2 Quick initialization

1. After positioner's power is turned on, press the key "" , "" and "" for over 10 seconds so as to enter the parameter mode, at this time the nethier line flickering.

Displays:

2. Holding the key "" Press over 10 seconds, the first line displays " STRT" , it means enter the automatic initialization.

Displays:

3.Procedures start from " STEP1 " to " STEP5 " , and the second line displays the current step.

Displays:

> **Caution:**
> When it presses the key "" for over 10 seconds during the initialization process, it may quit from the commissioning mode and enter the normal operation mode.

4. At the completion of the setting , the first line displays parameter values ; the second line displays " ED XXXX " , " XXXX " that means relevant initialization parameters, upper and lower dead band, and upper and lower Prediction values.

Displays:

5. Hold the key "" pressed for 10 seconds or no any press in 1min, it returns to normal operation mode.

5.3.3 Automatic initialization

1. After positioner's power is turned on, press the key "" for over 10 seconds so as to enter the parameter mode.

Displays:

2. Then press the key "" , the first line displays " no " and the second line displays "INIA", It enters automatic initialization mode.

Displays:

3. Press the key "[key]", the second line flickering and it enters the parameter revising mode.
4. Press the key "[key]" for over 10 seconds, the first line displays "STRT", that means starts the automatic initialization.

Displays:

5. Procedures start from "STEP1" to "STEP5" and the second line displays the current step.

> **Caution:**
> When it presses the key "[key]" for over 10 seconds during the initialization process, it may quit from the commissioning mode and enter the normal operation mode.

6. At the completion of the initialization, the first line displays parameter values; the second line displays "Ed XXXX", "XXXX" that means relevant initialized parameters, upper and lower dead band, and upper and lower Prediction values.

Display:

7. Hold the key "[key]" pressed for 10seconds or no any press in 1min, it returns to normal operation mode.

5.3.4 Manual initialization

1. Positioner is in an automatic mode after it is turned on. Hold the key "[key]" pressed for over 10 seconds to enter the user parameter mode.

Displays:

2. Press the key "[key]" to select parameter until the second line display "INIM".

Displays:

3. Then press the key "[key]", the second line display is flickering and it enters the parameter revision mode.

Displays:

4. Press the key "[key]" for over 10seconds, the first line displays "STRT" and it means start the manual initialization.
   Now, the second line displays "YA".

Displays:

5. Press "[key]" or "[key]" to setting the start-point.

Displays:

6. Press the key "[key]" to confirm. Now it displays "YE" at the second line.

Displays:

7. Press "[key]" or "[key]" to setting the end-point.

Displays:

8. Press the key " " to confirm, and initialization procedures continue run. it starts from "STEP1" to "STEP5", and the second line displays the current step.

Displays:

> **Caution:**
> When it presses the key " " for over 10 seconds during the initialization process, it may quit from the commissioning mode and enter the normal operation mode.

9. After the completion of the initialization, the first line displays parameter values; the second line displays "Ed XXXX", "XXXX" that means relevant initialized parameters, upper and lower dead band, and upper and lower Prediction values.

Displays:

10. Hold the key " " pressed for 10 seconds or no any press in 1min, it returns to normal operation mode.

5.4 Self-diagnosis

5.4.1 Enter diagnosis mode

At the normal operation interface, press the keys " " and " " for 10seconds to enter the self-diagnosis mode.

The first line displays parameter value and the second line displays parameter name.

Press the key " ", parameters page up circularly.

Press the key " ", parameters page down circularly.

5.4.2 Quit from the diagnosis mode

At the diagnostic mode interface: press the key " " over 10 seconds, it will quit from the diagnostic mode and return to automatic operating mode.

5.4.3 Self-diagnosis parameter table of valve positioner

No.	Parameter	Display code	Function	Contents/scope	Factory setting	Unit
01	CURR	CURR	Current	4.00~20.00		mA
02	STRK	STRK	Stroke range	0-100	100	mm/d
03	TUP	TUP	Up-stroke time	0-1000	100	s
04	TDW	TDW	Down-stroke time	0-1000	100	s
05	DBUP	DbUP	Dead band up	0.1~-100.0	1.0	%
06	DBDW	DbDW	Dead band down	-0.1~-100.0	-1.0	%
07	PUP	PUP	Prediction value up	0~-100.0	10.0	%
08	PDW	PDW	Prediction value down	-0.1~-100.0	-10.0	%
09	IMUP	IMUP	Impulse length up	0-5000	1250	
10	IMDW	IMDW	Impulse length down	0-5000	1250	
11	SSUP	SSUP	Short step zone up	0.1~-100.0	30.0	%
12	SSDW	SSDW	Short step zone down	0.1~-100.0	30.0	%

5.5 Alarm

5.5.1 Error alarm of parameter setting

When user sets valve's characteristic curve, wrong definition of the curve presents non-single increase / decrease, which displays:

Handling methods: Reset parameters

5.5.2 Error alarm of commissioning

When parameter setting or actuator action is wrong during commissioning, it will display:

Handling methods:

- Reset parameters.
- Check valve connection.
- Reset factory setting.

5.5.3 Over-limit alarm of the valve position

If valve position overruns limited position during operation, it will display:

Handling methods:

- Check the installation of positioner's feedback lever.
- Check the installation between positioner and actuator.
- Check the installation between mounting bracket and positioner.
- Adjust the parameter value of valve position limit.
- Reset the positioner.

5.5.4 Feedback signal over-limit alarm

During operation, when positioner's feedback value is >110% or <-10%, it will display:

Handling methods:

- Check the valve position input wire.
- Check the feedback senor, and replace it if necessary.
- Reset the positioner.

5.5.5 Input over-current alarm

During operation, when the positioner's input current is >110% or <-10%, it will display:

Handling methods:

- Check the positioner for its electrical connection.
- Check the input signal current value.

5.5.6 Valve jam alarm

Positioner can not drive the valve to the designated position due to certain causes, it will display:

Handling method:

- Clean the valve.
- Check the valve's connecting mechanism.
- Check the air supply.

5.5.7 Irregular alarm

When the positioner's inner hardware has trouble, it will display:

Handling methods:

- Inform the supplier to handle it.

5.6 Parameter list

No. / Parameter		Display code	Function	Contents/scope	Factory setting	unit
No.	P1					
01	INIA	INIA	Automatic initialization: Not started/Started	NO/STRT	NO	
02	INIM	INIM	Manual initialization : Not started/Started	NO/STRT	NO	
03	UNIT	UNIT	Unit of valve position Percentage/Millimeter/Angle	P/MM/DEG	P	
04	TYPE	TYPE	Actuator type: Linear/Rotary	LINE/TURN		
05	YWAY	YWAY	Stroke scope	OFF 5/10/15/20/ 25/30/35/ 40/50/60/ 70/80/90/ 100	OFF	mm
06	DEBA	DEbA	Controller's dead band	AUTO 0.1 ~ 10.0	AUTO	%
07	PRED	PRED	Prediction value	AUTO 0.1 ~ 10.0	AUTO	%
08	PRST	PRST	Reset factory setting Not started/Started	NO/STRT	NO	

No. / Parameter		Display code	Function	Contents/scope	Factory setting	unit
No.	P2					
09	SDIR	SDIR	Direction of input signal	RISE/FALL	RISE	
10	SPRA	SPRA	Split range start	0.0 ~ 100.0	0	%
11	SPRE	SPRE	Split range end	0.0 ~ 100.0	100	%
12	TSUP	TSUP	Setpoint ramp up	AUTO 0 ~ 400	AUTO	s
13	TSDO	TSDO	Setpoint ramp down	AUTO 0 ~ 400	AUTO	s
14	SFCT	SFCT	Valve characteristics - Linearity - Equal percentage - Quick-open - User's definition	LINE/ 1:30/ 30:1/ FREE	LINE	
15 ~ 25	SP00 ~ SP10	SP00 ~ SP 10	Valve characteristic curve defined by the user	0.0 ~ 100.0		%

No. / Parameter		Display code	Function	Contents/scope	Factory setting	unit
No.	P3					
26	YA	YA	Low limited value of Stroke	0.0～100.0	0.0	%
27	YE	YE	Up limited value of Stroke	0.0 ～100.0	100.0	%
28	YDIR	YDIR	Stroke direction	RISE/FALL	RISE	
29	YCDW	YCDW	Manipulated value for tight closing, bottom	OFF 0.0 ～ 100.0	0.5	%
30	YCUP	YCUP	Manipulated value for tight closing, top	OFF 0.0 ～ 100.0	99.5	%

No. / Parameter		Display code	Function	Contents/scope	Factory setting	unit
No.	P4					
31	SAFE	SAFE	Safety valve position: Off / Keep / Fully close / Setpoint / Fully open	OFF / KEEP/CLOSE / 0.01～99.9 / OPEN	OFF	%
32	BIN	bIN	Function digital input: active the safety position.	ON/OFF	OFF	
33	DO1	DO 1	Function digital output 1: Fault alarm Fault + non-automatic Fault + non-automatic + BIN Lower than setpoint Higher than setpoint	FAULT NA NAB LSET HSET	FAULT	
34	SW1	SW 1	Setpoint	0.0 ～ 100.0	0.0	%
35	DO2	DO2	Function digital output 2: Automatic/manual Lower than Setpoint Higher than Setpoint	A/M LSET HSET	A/M	
36	SW2	SW2	Setpoint	0.0 ～ 100.0	0.0	%
37	AMIN	AMIN	low stroke output current	4.0～20.0	4.0	mA
38	AMAX	AMAX	High stroke output current	4.0～20.0	20.0	mA
39	ADIR	ADIR	Direction of output current.	RISE/FALL	RISE	

6 Parameter Explanation

1. INIA

Automatic initialization

See chapter 6.3.2 for automatic initialization procedures

2. INIM

Manual initialization

See chapter 6.3.2 for annual initialization procedures

3. UNIT

valve position display unit

Display could be percentage/millimeter/angle (P/MM/DEG)

4. TYPE

Type of actuator

Selection of actuator: Linear actuator (LINE), Rotary actuator (TURN).

5. YWAY

Stroke scope

Position will display actual displacement after commissioning and only display after unit is selected.

If "OFF" is selected, the actual stroke would not display.

6. DEBA

Dead band

At DEBA=AUTO the dead band equals to commissioning value. The dead band is gradually increased on detecting a actuator control oscillation, it's usually set auto.

7. PRED

Prediction value

At PRED=AUTO prediction value equals to commissioning value. The prediction value is gradually increased on detecting a actuator control oscillation, it's usually set auto.

8. PRST

Reset factory settings.

Reset of factory settings and reinitialize it.

> **Caution:**
> The positioner must be reinitialized after "PRST".
> All recomputed maintenance parameters should be reset.

9. SDIR

Direction of input signal

Relationship between control input and valve position (see Fig. 12)

10. SPRA

Split range start (see Fig.12)

11. SPRE

Split range start (see Fig.12)

Parameters "10.SPRA", "11.SPRE" and "9.SDIR" serve to restrict the effective Split range. In such a way, it can resolve split range tasks with the characteristic curve.

- Rise / fall
- Fall / rise
- Fall / fall
- Rise / rise

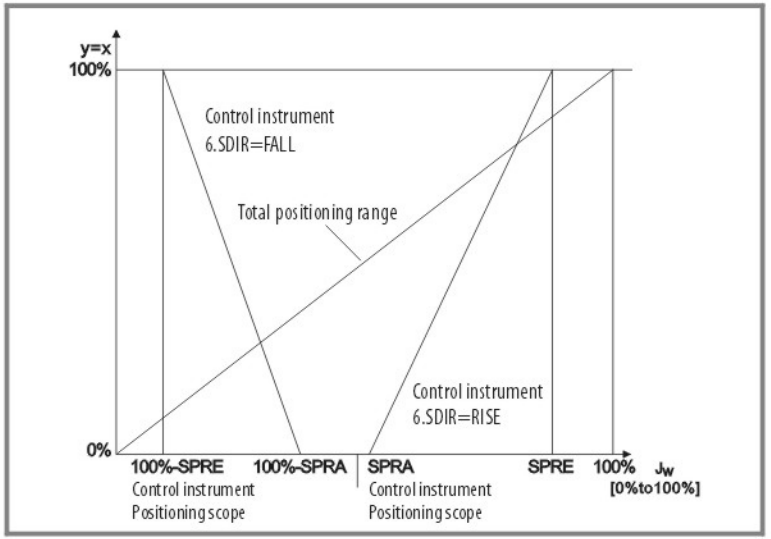

Fig. 12 split range tasks with two instruments

12. TSUP

Setpoint ramp UP

When switchover from manual operation to automatic the active setpoint is adjusted to the setpoint on the positioner with the setpoint ramp. At TSUP = AUTO, Setpoint ramp equals to commissioning value.

13. TSDO

Setpoint ramp DOWN

It is the same as that in Article 12.TSUP above. The factory setting is AUTO.

14. SFCT

Valve characteristic curve

Non-linear valve characteristics can be linearized with this function and any flow characteristics simulated in linear valve characteristics.

This instrument is stored with 4 kinds of valve characteristic curves:

- Linear (factory setting)
- Equal percentage 1:30
- Quick-open
- User define

15. SP00~25.SP10

User-define value of valve characteristic curve.

A flow parameter can be assigned to the respective setpoint turning value at an interval. These points lead to a polygon chain with 10 straight line which therefore represent a projection of the valve characteristic.

The setpoint vertex values can only be input at 14.SFCT=free. You may only enter a strictly monotonous down or up characteristic. The user-define curve can only be single rising or single falling.

16. YA

Low limited value of Stroke

17. YE

Low limited value of Stroke

With the parameters "YA" and "YE", the mechanical action distance is limited to the set values.

18. YDIR

Forward and backward actions of the valve position feedback

At YDIR=RISE, the position feedback potentiometer value rising, the direction of valve action rising.

At YDIR=FALL, the position feedback potentiometer value rising, the direction of valve action falling.

19. YCDW

Manipulated value for tight closing, bottom

With this function the valve can be driven to the seat with the maximum closeness. YCDW is used to prevent mechanical damage resulted from air blowing.

20. YCUP

Manipulated value for tight closing, top

With this function the valve can be driven to the seat with the maximum openness. YCUP is used to prevent mechanical damage resulted from air blowing.

21. SAFE

For safety valve position, it is effective only 32.BIN selects ON. After start this function, safty valve position state is enactment by setting value.

22. BIN

Function digital input: active the safety position.

23. D01

Function digital output 1.

24. SW1

Response threshold alarm 1:

When 33.DO1 at LSET OR HSET, SW1 response to D01 alarm threshold.

25. D02

Function digital output 2

26. SW2

Response threshold alarm 2:

When 35.DO2 at LSET OR HSET, SW2 response to D02 alarm threshold.

27. AMIN

low stroke output current

The output current is a function module output of the positioner.

28. AMAX

high stroke output current

29. ADIR

Direction of output current

At ADIR=RISE, the valve position value rising, the output current value rising.

At ADIR=FALL, the valve position value rising, the output current value falling.

7 Trouble shooting and maintenance

7.1 Trouble shooting

In case of trouble, remove the trouble according to the following procedures.

If trouble cannot be debar, please contact Maxonic Automation Control co, ltd.

Trouble symptom	Cause	Solution
Actuator Jam	• Air supply Pressure is <0.14Mpa.	• Adjust air supply pressure to >0.14Mpa.
	• Damp pneumatic pipe.	• Supply of dry air.
Piezo-valve doesn't operate	• Piezo-valve is poorly fixed.	• Retighten the screws.
	• Foreign object in the pneumatic pipeline.	• Inform the factory to replace or repair the piezo-valve.
	• Poor connection of circuit board with piezo-valve.	• Check the circuit board and piezo - valve for their connection.
Piezo-valve long time working	• Pneumatic system leaks air.	• Check the air supply system.
		• If positioner leaks air, inform the factory to replace or repair it.
Valve position oscillates	• Wrong setting of the positioner	• Increase dead band range and adjust the Prediction value.
	• Wrong installation	• Check the installation and re - commistioning it.
The positioner cannot drive the Valve open completely or close	• Air pressure is too small.	• Increase air pressure.
No display	• Input signal is too small.	• Check the input signal.
	• Electrical connection terminal screws are loosing.	• Tighten the terminal screws.

WARNING: Do not make any changes to explosion-proof devices.

7.2 Maintenance and service

1) Positioner is a field instrument that has to be maintained periodically. The air source of the positioner shall keep dry and clean. It shall periodically exhaust water and pollutant from the filtering pressure regulating valve that is used with the positioner so as to avoid water from entering the positioner to affect its normal operation.
2) Since positioner's connecting feedback system may become loose due to long operation, it shall periodically check the screws for looseness. If there is any looseness, tighten the screws and then reset the zero of the positioner.
3) In order to observe the operation of the positioner, it shall keep air and output pressure gauges clean.
4) For maintenance of the positioner's explosion-proof part, it shall carry out check and maintenance according to related regulations of the State.

8 Transportation and Storage

1) Before transportation, check whether all signs and labels are integral and complete, packing boxes are solid and reliable. And finally, check the package for reliability and safety.
2) Load and unload the product gently, and it is forbidden to strike, crush, moisten and damage the instrument during transportation.
3) It shall be stored in a room with a storage temperature of 5~40℃ and a relative humidity of not more than 90%, and there are no harmful impurities in the air, which would corrode the instrument.
4) It shall be placed according to the symbols as shown on the packing box, and keep upright.

9 Information for Order

9.1 Product model

Detail product models are listed follow:

MVP	□	□	–	□	–	□	□	S	□	□	□	□

Communications option

0	Without
H	HART
N	Others

External indicator

0	Without
1	With external indicator

Position switch output

0	Without
K	2-micro switches
S	2-digital switches
C	4-position switches (2-micro switches + 2-digital switches)

Position transmit

0	Without
A	Position signal output: 4～20mA

Input signal

S	4～20mA

Pressure gauge

0	Without
1	With pressure gauge

Electrical / air connections

1	M20 x 1.5 and G1/4
2	M20 x 1.5 and 1/4NPT

Explosion-protection

0	Without
1	EExia II CT4-T6

Form of connecting parts

L	Linear actuator connection
Q	Rotary(Quater) actuator connection

Action form of actuator

1	Single-action
2	Double-action

MVP series intelligent electropneumatic valve positioner

9.2 Miscellaneous

1. In case of need for connection bracket, please mark it in ordering, and confirm on it's idiographic dimension.
2. We can provide customers with associated products: HART modem, precedence monitoring software, special installation accessories and air filtering pressure regulating valve, etc.
3. Special product, please confer with Maxonic.