

## INSTALLATION, OPERATION AND MAINTENANCE MANUAL



### **GSP Smart Positioner for Pneumatic Actuators**

Ref. GENE BRE: 5954 00

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## INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

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## 1. Product Description

The GSP Smart Positioner is used for linear or rotary valve operations with pneumatic actuator via an electric controller or control system using analogue output signal of 4 – 20 mA. **Exclusively for use on Spring Return actuators.** Easy adjustment (fully automatic) from zero to span. Easy to change rotation (clockwise / anti-clockwise). Low air consumption and easy connection of air tubes.

## 2. Technical Data and Specifications

CARACTERÍSTICAS TÉCNICAS - TECHNICAL DATA							
Descripción / Description		Valores / Values		Descripción / Description		Valores / Values	
1	Modelo / Model	5954 00		10	Protección ATEX / <b>Explosion Proof</b>	Non-Explosion	
2	Señal de entrada / <b>Input signal</b>	4 - 20 mA, 20% - 100%		11	Protección / <b>Protection</b>	IP66	
3	Tensión de alimentación retransmisión / <b>Power supply for feedback</b>	24 VDC (only ref. 5954 04)		12	Temperatura ambiente / <b>Ambient temperature</b>	-20°C ~ 60°C (-4°F ~ 140°F)	
4	Impedancia / <b>Impedance</b>	310 Ω (20 mA, 6.2 VDC)		13	Humedad relativa / <b>Relative humidity</b>	< 75% (sin condensación / with no condensation)	
5	Presión de entrada / <b>Supply pressure</b>	1.4 – 6 bar (20 – 90 psi)		14	Curva de funcionamiento / <b>Performance curve</b>	Linear / EQ.%1:25 / EQ.%1:50 / EQ.%25:1 / EQ.%50:1	
6	Rango de aplicación / <b>Application range</b>	0 – 120° (Rot.) / 0 -60° (Lin.)		15	Precisión / <b>Precision</b>	≤ 1%	
7	Conversión A/D (muestreo) / <b>A/D conversion (sampling rate)</b>	20 ms		16	Consumo de aire / <b>Air consumption</b>	≤ 0.04 Kg/h	
8	Conexión del aire / <b>Air connection</b>	NPT 1/4" (G 1/4" with included adapter)		17	Material / <b>Material</b>	Aleación de aluminio / <b>Aluminum alloy</b>	
9	Conexión eléctrica / <b>Electric connection</b>	G 1/2"		18	Peso / <b>Weight</b>	2 kg (4.4 lb)	

-Table 1-

## 3. Safety Instructions

The scope of this manual is to allow technically competent users to install, start up, operate and inspect Genebre electro-pneumatic positioners. Qualified personnel must be well versed with all the warnings and notes detailed in these instructions. Failure to observe the warnings and notes could result in personal injury and material damage.



**Must abide by general electric safety code when conducting the electric connection. During the process of operating, must abide by the electric equipment safety operation rules**



**Must strictly abide by the requirements of this instruction when connecting directly with 24VDC power supply. Must avoid to connect it into the signal circuit. Otherwise, the circuit main-board may be damaged.**



**Certain parts of the positioner are subject to mechanical movement which could cause injury.**

**Any work carried out on the system or electrical equipment must be performed by qualified technicians or by specially trained personnel under the control and supervision of said technicians, in accordance with safety regulations and standards, as well as any other applicable national legislation.**



**Any misuse could cause serious damage to the components, installations and the equipment itself as well as personal injury. Under no circumstances must any component or part of the positioner be modified or altered. Any such alterations or modifications shall automatically invalidate the intended use of the positioner.**

## 4. Transport and Storage Conditions

- The positioners are dispatched from the Genebre, S.A. facilities in suitable packaging to prevent any blows.
- Any sling, rope or chain used to lift or transport the motorised valves must **NOT** be attached to the positioner under any circumstances.
- The supports of the positioner are designed to bear operating stresses, **NOT** the total weight of the valve, nor any other type of load or stress.
- Do **NOT** knock the positioner against walls, floors or other devices. This may cause severe damage to the positioner or its components.
- Store in a dry and well ventilated place, protected from weather conditions. Avoid placing directly on the floor. Use pallets, shelving or wooden bases. The storage temperature is -30°C ~ 85°C.
- Genebre, S.A. recommends a visual inspection to check for any possible damage during transport and storage. The visual inspection must include the interior of the compartments.

## 5. Preliminary Checks

- Verify that the characteristics of the positioner correspond to the characteristics required prior to installation and start-up. These data can be found on the label.
- In the case of a deviation or non-conformity, contact Genebre, S.A.



**Ensure that the air supply to be used is dry, clean and filtered as a poor quality air supply could severely damage the positioner.**

- **Maximum air supply pressure 6 bar (90 psi)**
- Check that the following accessories are included in the packing box: rotating Lever and threaded Nipple.

## 6. Installation

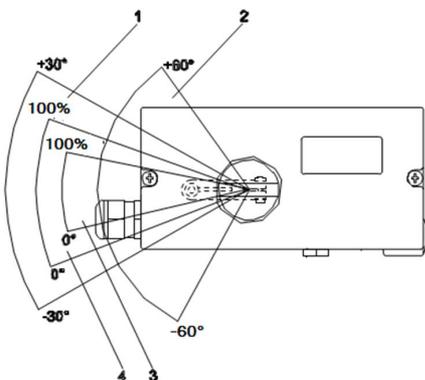
### 6.1 Mechanical Installation



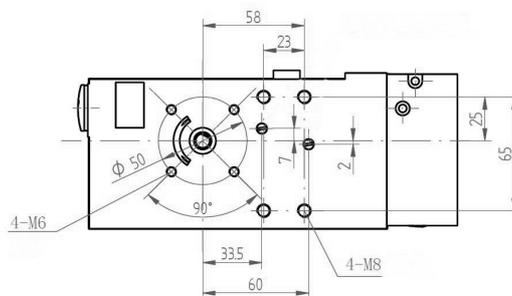
**Before installation, make sure the specifications meet the standards, the environment temperature is  $-20^{\circ}\text{C} \sim 60^{\circ}\text{C}$ , there is no strong vibration and no electromagnetic interference.**

Firstly, check that the shaft rotates freely. The rotation area is marked between two arrows. During the installation, the rotation angle need only rough adjustment. The fine adjustment will automatically done during the auto adjustment process.

The travel range of the positioner is illustrated on Fig. 1.



-Figure 1-



-Figure 2-

Description (Fig. 1):

1- Sensor range of the linear actuator  
2- Sensor range of the rotary actuator

3- Working range of the linear actuator  
4- Working range of the rotary actuator

The "sensor range" means the maximum range which is measurable by the rotating shaft.

The "working range" is the maximum range provided by the valves and their mechanical devices and it is calculated during the auto adjustment process.

The dimensions of the connecting holes are shown on Figure 2.

## 6.2 Commanding linear actuator

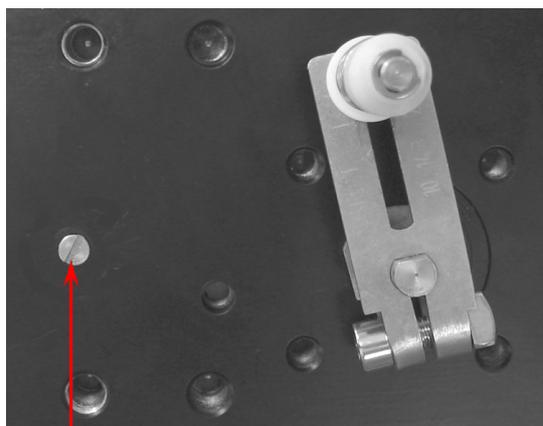
### 6.2.1 Installation on Genebre Control Valve art. 5065/5065A

The installation of the positioner over the Genebre Control Valve is fast and easy. The following components are needed: rotating Lever (included), two screws M8 x 60 (Allen) and one o'ring/gasket Ø10 x 2 (or similar). Procedure:



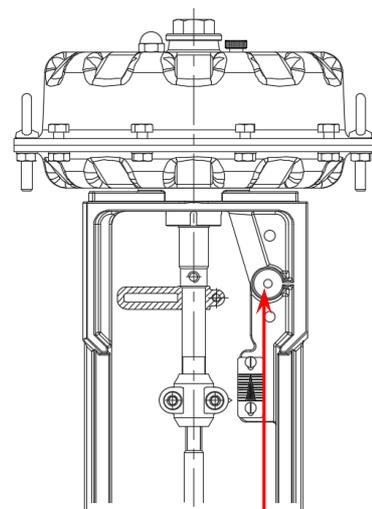
**Do not supply air to the positioner during this operation. It could be dangerous!**

1- Remove the plug from the air outlet of the positioner (Fig. 3). Put the o'ring in air inlet of the valve (Fig. 4). You can use some grease to fix the o'ring in the hole.



-Figure 3-

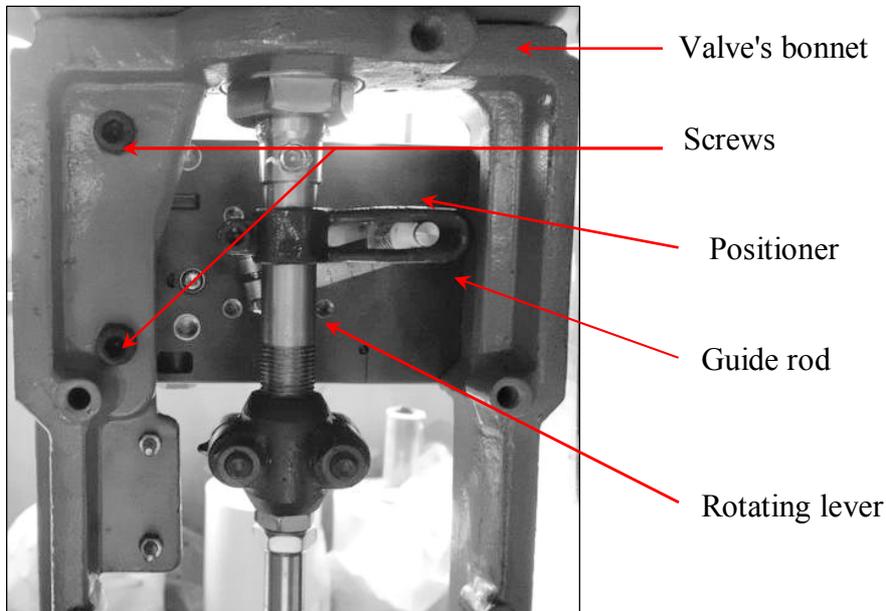
AIR OUTLET (positioner)



-Figure 4-

AIR INLET (valve)

2- Assemble and screw the positioner with attached *lever* (see sect. 6.2.3) over the *air inlet* located in the *valve's bonnet*, watching that the pin of the lever is introduced in the *guide rod of the valve*. See Fig. 5.



-Figure 5-

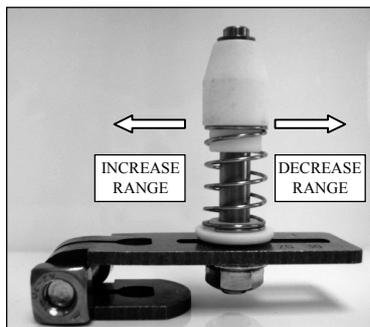
**IMPORTANT:** during the installation check that, with the **valve closed**, the *guide rod* is slanted at approximately 25° o 30° respect to the horizontal line.

### 6.2.2 Installation on any other Control Valve with Linear actuator

The installation of the positioner over the valve will depend on its design. In this case, it will be necessary to make a special support adapted to valve and positioner. Besides, must use an air pipe to connect Out1 from the positioner to the air inlet of valve or actuator.

### 6.2.3 Assembling and adjustment of the lever

Connect the lever with the shaft of the positioner and tighten the screw.



-Figure 6-

Check if the lever travel is within the operation range (between the arrows around the shaft). See Figure 1.

The scales on the lever represent linkage points of various travels.

The travel range can be changed by loosening the nut and moving the swivel along the groove.

If the linkage point moves inward, the travel range increases. Otherwise, if the linkage point moves outward, the travel range decreases (Fig. 6).

When the adjustment is finished, the linkage will conduct fine adjustment automatically during the Auto adjustment process.

REMARK: for Genebre's Control Valve use num. 20 ( $\leq 2"$ ) or num. 30 ( $2\frac{1}{2}" \sim 4"$ ).

### 6.3 Commanding rotary actuator

Genebre S.A. can supply "Adapter Kit for rotary actuator" for assembling the smart positioner over the rotary actuator. It is necessary that holes and shaft of the actuator meet the requirements of the standard NAMUR VDI/VDE 3845. The Kit includes support, coupling and screws (for assembling positioner and support).

Procedure: - first of all, determine the installation position (parallel / ortogonal) and the rotation direction of the actuator (clockwise/counterclockwise).  
- move the rotary actuator to its initial position and adjust the coupling and the shaft accordingly. Tighten the screws to fix the coupling.

### 6.4 Air connection

All pneumatic pipe connections are on the right side of the positioner, which provides NPT 1/4" (if necessary, use the thread adapter G $\leftrightarrow$ NPT included in the box).

The corresponding connection pieces should be configured by the user. We recommend a pipe size  $\varnothing 6 \times 1$  mm. Supply pressure: 1,4 ~ 6 bar.



**Caution: Ensure that the supply air to be used is dry, clean and filtered**

1. Use a regulator with a filter to maintain a constant air supply pressure (optimum supply pressure of 6 bar to operate the actuator).
2. Completely purge the circuit of air to avoid any foreign bodies.
3. On applications with single action actuator (spring return), air outlet is OUT1 or the hole in the back of the positioner (see Fig. 3).
4. Use the two pressure meters to control air in and out respectively.

### 6.5 Electrical connection

Connect the (+) and (-) supply terminals to the respective (+) and (-) input terminals of the positioner and the feedback (if available), as appropriate. See Fig. 7.



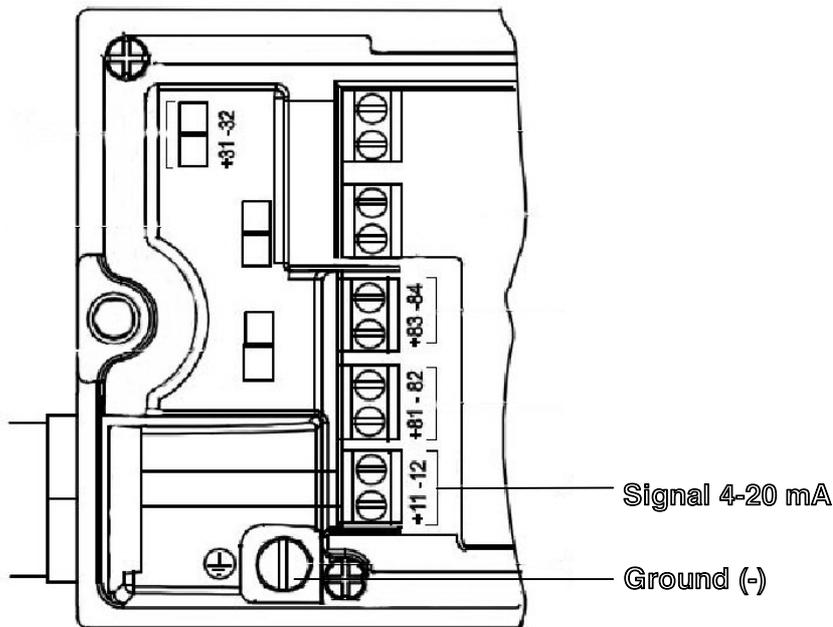
**Must strictly abide by the requirements of this instruction when connecting directly with 24VDC power supply. Must avoid to connect it into the signal circuit. Otherwise, the circuit main-board may be damaged.**



**Must avoid to be close to power line or installation signal line because the power line could produce interference which would affect the use of the positioner.**

On the left side of the box, there are two tapping holes G 1/2" which are used for allowing the power line to enter through the box. One hole is equipped with wiring joint. The hole below is a backup hole which is sealed by a plug.

Remove the two screws to open the box.



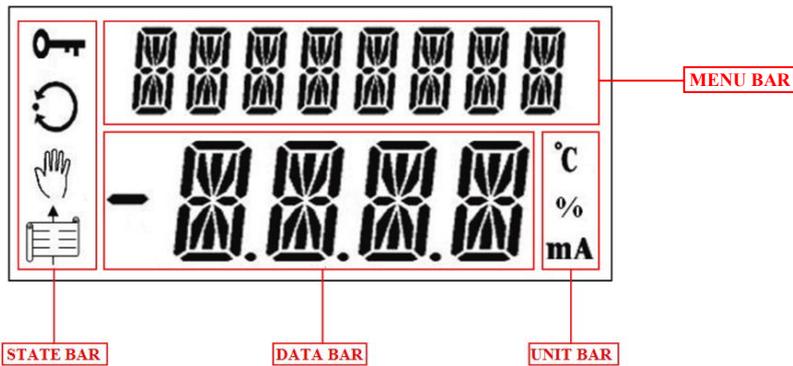
-Figure 7-

## 7. Operation of the GSP Smart Positioner

### 7.1 User Interface

#### 7.1.1 Display

See Fig. 8.



-Figure 8-

**MENU BAR:** Displays several parameter group of operational mode and configuration adjusting mode, menu name and error message.

### STATE BAR:

-  The positioner is under the automatic control or automatic adjustment mode, and during the testing operation mode. Displayed as blink.
-  The positioner is under the manual control or manual setting valve position data state. During the configuration adjusting displayed as blink.
-  The system function is locked. Cut the power off to unlock.
-  The positioner is under the configuration adjusting mode. The system is out of operating state and all controls are invalid.

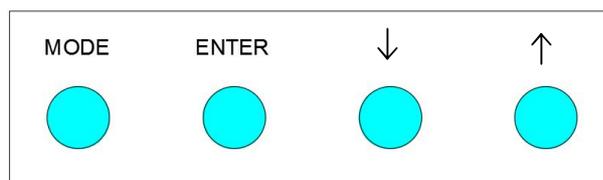
**DATA BAR:** Displays operating data and configuration parameter options.

**UNIT BAR:** Displays data units (% , °C, mA)

**REMARK:** the working temperature of the LCD is -20°C ~ 60°C.

### 7.1.2 Keyboard

To access the keyboard must unscrew and remove the cover of the GSP Smart Positioner.



-Figure 8-

**MODE:** function key, used to switch data bar functions and to be combined with other keys.

↑ : increase key, used to increase the displayed value and to be combined with other keys. Single click increases the value with single step. Press and hold the key, the value will increase continuously until reaching the maximum limit; using the key combined with the MODE key will rapidly increase the value.

↓ : decrease key, used to decrease the displayed value and to be combined with other keys. Single click decreases the value with single step. Press and hold the key, the value will decrease continuously until reaching the maximum limit; using the key combined with the MODE key will rapidly decrease the value.

**ENTER:** confirmation key, used to confirm the data information and to be combined with other keys.

Table 2 shows the function of several combination function keys:

Key name	Function
MODE	Select operational mode
↑	UP direction button Select data bar
↓	DOWN direction button Change units (% , °C, mA)
ENTER	Acknowledge message Start action Save in the non-volatile memory
ENTER + ↑	Choose configuration submenu
ENTER + ↓	Choose configuration submenu
MODE + ENTER	Exit from configuration submenu

-Table 2-

## 7.2 Operational modes

The GSP Smart Positioner has two operational modes for selecting: manual or automatic.

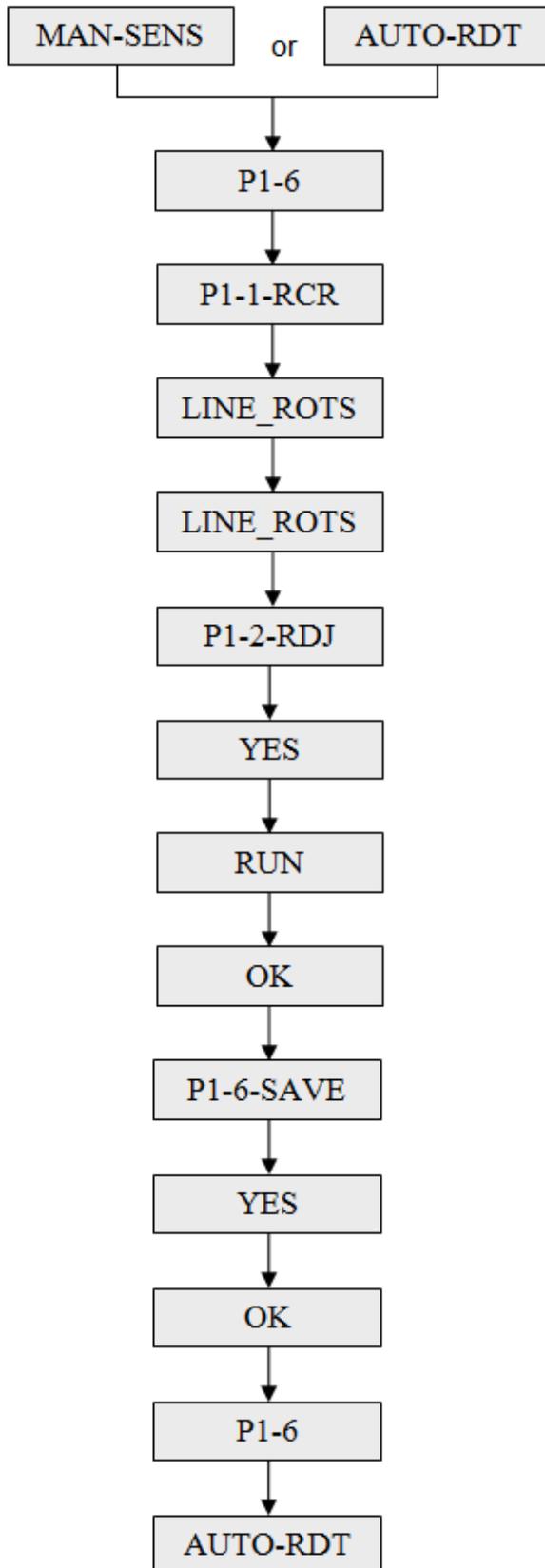
- ◆ **MAN-SENS (manual mode):** manually operated within the range of sensor by pressing “↑” or “↓” keys (see section 7.1.2). Position in percentage.
- ◆ **MAN-PENS (manual mode):** idem to MAN-SENS, but the position is indicated according to travel degree of the shaft of the positioner. See "Application Range" in Table 1.
- ◆ **AUTO-RDT (automatic mode):** automatically operated within the range of sensor by sending 4-20 mA signal.

**(AUTO-PID and AUTO-MIX modes are only for internal use, not user accessible)**

## 7.3 Auto adjustment function

Before starting up, the equipment must necessarily be auto adjusted using this powerful function.

The procedure is shown below step by step:



- (1) Press ENTER key for 3 seconds
- (2) Press ENTER + “↑” at the same time
- (3) Press “↑” or “↓” to choose actuator type
- (4) Press ENTER to save the type
- (5) Press ENTER + “↑” at the same time
- (6) Press “↑” or “↓” to choose auto adjust
- (7) Press ENTER key
- (8) Wait 2-3 minutes for the operation
- (9) Press ENTER + “↑” keys until display
- (10) Press “↑” or “↓” to choose YES or NO
- (11) Press ENTER key
- (12) Press MODE + ENTER at the same time
- (13) Press ENTER key for 3 seconds

**SPECIAL NOTE:** If during the auto adjustment process you see that it swings from side to side around the setting point, try changing parameters 5BT and 6SU parameters from the sub-menu P5.12. Remember to save the changes and repeat the auto adjustment process.

**ATTENTION:** In case of rotating actuator there is another parameter to keep in mind which is the rotating direction of the actuator (see P3\_3\_RCT in section 7.4 *Configuration parameter adjustment*). It is clockwise by default (CLOCK).

## 7.4 Configuration parameter adjustment



We recommend not changing any of the following parameters unless it is strictly necessary

Regardless of the operational mode is under the automatic or manual, provided the function lock is unlock, press and holding ENTER key, counting down 3 seconds, then releasing will enter the configuration project interface; press MODE key will switch configuration group; press ENTER+ “↑” or ENTER+ “↓” keys will switch configuration submenu; press MODE+ENTER will exit from configuration submenu; press and hold MODE key will exit from configuration project group interface and end the configuration parameter adjustment. There are eight configuration project groups in the system:

- ◆ **P1.6 Automatic Parameter Setting**
- ◆ **P2.10 Input Parameter Setting**
- ◆ **P3.4 Mechanical State Parameter Setting**
- ◆ **P4.4 Travel Parameter Setting**
- ◆ **P5.12 Control Parameter Setting**
- ◆ **P6.6 Warning Parameter Setting**
- ◆ **P7.5 Valve Feedback Output Parameter Setting**
- ◆ **P8.8 Function Options**

Next is a brief introduction of every configuration group:

- ◆ **P1.6 Automatic Parameter Setting**
  - ❖ **P1\_1\_RCR** is actuator type option. When the positioner runs under the linear travel mode the sensor range is -30°~+30°; under the rotary travel mode (ROTS), the sensor range is -60°~+60°; the default setting is LINE.

- ❖ **P1\_2\_RDJ** is automatic adjustment. It should be chosen when the positioner installation or the mechanical position is changed, and when the automatic adjustment is needed. This function will take the following actions:

- Automatically select the direction of the actuator;
- Automatically select the mechanical travel distance of the actuator;
- Automatically set the uplink and downlink time of the actuator;
- Control the parameters;
- Compensate the I/P module.

Select YES to enter into the automatic adjusting process; select NO to enter into the P1-3 menu.

See 7.3. *Auto adjustment* for setting the automatic adjustment.

- ❖ **P1\_3\_BRND** is control tolerance range (0,30%-10%), default value is 0,30%. The tolerance is set up with +/- range around the setting point. The system is balance only when the sensitive range is reached.
- ❖ **P1\_4\_STEP** is not available.
- ❖ **P1\_5\_TEST** to check the automatic adjustment. User can test various adjusted parameter index and check if the parameter index meet the requirement or not. Select YES or NO. The test ends after 10-30s.
- ❖ **P1\_6\_SAVE** select YES to save or NO to exit.

## ◆ **P2.10 Input Parameter Setting**

- ❖ **P2\_1\_MIN** is the minimum value of input electric current, which is the initial current when the positioner controls the operating of the actuator. The default setting is 4.0, the amended setting lower limit is not lower than 3.8.
- ❖ **P2\_2\_MAX** is the maximum value of input electric current, which is the cut-off current when the positioner controls the operating of the actuator. The default setting is 20.0, the amended setting upper limit is not higher than 20.5.
- ❖ **P2\_3\_CHR** is selecting input control characteristic curve type (LINE, 1:25, 1:50, **25:1**). The default setting is LINE. Using the “↑” or “↓” key can search the curve type. Press the ENTER key to confirm the selection.
- ❖ **P2\_4\_ACT** is selecting actuator direction. DIRC is positive direction (4-20mA corresponds to position 0—100%), REVR is reverse direction (4-20mA corresponds to 100—0%). The default setting is DIRC.
- ❖ **P2\_5\_QOF** is control valve’s quick closing range. When input signal enters the range, the actuator will get immediately the failure position (closed for NC actuators / open for NO actuators). The range is from 0% to 100%. The default setting is 0%.
- ❖ **P2\_6\_TUP** is maximum uplink time, which is the time spend by the actuator while up going.

It can be set by user as required. After setting, if the up going time exceed the setting time, there comes warning. The adjustable range is 0-100s, the default setting is 10s.

- ❖ **P2\_7\_TDN** is maximum downlink time, which is the time spend by the actuator while down going. It can be set by user as required. After setting, if the down going time exceed the setting time, there comes warning. The adjustable range is 0-100s, the default setting is 10s.
- ❖ **P2\_8\_CUS** is user's curve amendment.
- ❖ **P2\_9\_TEST** is user's testing.
- ❖ **P2\_10\_SAV** is exiting and saving. YES: save; NO: not saving.

#### ◆ **P3.4 Mechanical State Parameter Setting**



**Before conducting the operation of P3-1 or P3-2, make sure the control valve is under the safe condition and separated from the craft system. When the operation reaches its terminal, pay special attention to the valve range in order to avoid the possible personal injury resulted from full speed valve.**

- ❖ **P3\_1\_MIN** is the minimum value of the mechanical range. The value is determined within the sensor range. It is normally determined by auto-adjusting. But when the actuator has not a mechanical stop limiting device or when the actuator cannot be driven to the mechanical stop site, some necessary manual adjustments are required after the auto adjusting. The adjustable range is 0-100%. Default setting is 0%. The adjusting operation is conducted by adjusting the valve's value and reading the actual valve's opening position through using "↑" and "↓" keys.
- ❖ **P3\_2\_MAX** is the maximum value of the mechanical range. The value is determined within the sensor range. It is normally determined by auto-adjusting. But when the actuator has not a mechanical stop limiting device or when the actuator cannot be driven to the mechanical stop site, some necessary manual adjustments are required after the auto-adjusting. The adjustable range is 0-100%. Default setting is 0%. The adjusting operation is conducted by adjusting the valve's value and reading the actual valve's opening position through using "↑" and "↓" keys.
- ❖ **P3\_3\_RCT** is the action direction option of actuator. CLOCK is clockwise rotation; CTCL is anti-clockwise rotation. The default setting is CLOCK.
- ❖ **P3\_4SAVE** is save and exit. YES: save; NO: not save.

#### ◆ **P4.4 Travel Parameter Setting**

- ❖ **P4\_1\_MIN** is the minimum value of travel of control travel. The adjustable range is 0-100%, the default is 0%.

- ❖ **P4\_2\_MAX** is the maximum value of travel of control travel. The adjustable range is 0-100%, the default is 100%.
- ❖ **P4\_3\_VRL** is to adjust the valve's air opening or air closing direction. OFF is the air closing valve; OPEN is the air opening valve. The default setting is OPEN-Air opening (Normally Closed).
- ❖ **P4\_4\_SAVE** is save and exit. YES: save; NO: not save.

#### ◆ **P5.12 Control Parameter Setting**



**This parameter is the result of auto-adjusting. We recommend not to do any change**

- ❖ **1FU** is high speed aerating action
- ❖ **2FD** is high speed exhausting action
- ❖ **3FP** is medium speed aerating action
- ❖ **4FB** is medium speed exhausting action
- ❖ **5BT** is low speed aerating action
- ❖ **6SU** is low speed exhausting action
- ❖ **7SD** is adjusting aerating time
- ❖ **8TF** is aerating buffering time
- ❖ **9TB** is exhausting buffering time
- ❖ **10T** is adjusting exhausting time
- ❖ **P5\_11RST** is parameter reset
- ❖ **P5\_12SAV** is save and exit. YES: save; NO: not save.
- ❖ **P6\_8SAV** is save and exit. YES: save; NO: not save.

#### ◆ **P8.8 Function Options**

- ❖ **P8\_1\_TRG** is set value of travel time limit. Adjustable range is 10.0-200.0s. The default setting is 30s.

- ❖ **P8\_2\_POS** is not available.
  - ❖ **P8\_3\_FRC** is the default setting value of positioner's various configuration parameter. Select YES to start a FACTORY RESET. All parameters will be same as first time use. Select NO for not downloading any data.
  - ❖ **P8\_6\_POP** is starting up state option, used to set starting up operation mode. The default setting is AT\_R (AUTO-RDT).
  - ❖ **P8\_7\_RDJ** is P1\_2 configuration state setting. SCLE adjusts upper and the lower limit only; MIDD adjusts midpoint only; MISP adjusts maximum speed only; TINY adjusts minimum speed only; ALL adjusts all. The default setting is ALL.
  - ❖ **P8\_8SAVE** is save and exit. YES: save; NO: not save.
- ◆ **P9.24** is for internal use. Do not modify it.

## 8. Start-up

- ◆ Check whether the installation is correct or not; open the air supply of the positioner, check whether the air pressure is between 1,4~6 bar and whether there is air leakage or not.
- ◆ Connect the 4~20mA analog signal input to the positioner terminal +11-12.
- ◆ Switch on the signal, screen is lighted, press the **MODE** key several times until displaying "MAN-SENS" (manually operate within the range of sensor).
- ◆ Press ↑ or ↓ key, let the actuator moves to its mechanical limits (two directions). Observe the movement of the actuator carefully. Check whether the movement is smooth or not, and the installation of the guide rod is correct and firm or not. When the actuator is at the 50% of the travel range, observe and adjust the guide rod to make sure it is also nearby. Check if the scale value of the guide rod coincides with the travel range value of the actuator (see section 6.1.3).
- ◆ Make sure the auto adjustment is already set up. If not yet, please go to Section 7.4 and follow the procedure. After self-adjusting and when the screen displays "AUTO-RDT", change the input signal, observe the data on the display screen, and check if it is consistent with the actual position of the actuator.
- ◆ When conducting self-adjusting, "ERR" is displayed or warning blinks, please refer to error message section.

## 9. Maintenance

Although this equipment is maintenance free it is recommended to carry out frequent inspections, which must include:

- Checking the assembly / alignment of the actuator and positioner.
- Verifying the electrical signal connection.
- Ensuring that all the screws are present and are firmly tightened.
- Checking the status of the air filters of the installation to ensure the quality of the air reaching the equipment.

**Remark:** The GSP Smart Positioner provides an air filter behind the pressure meter of the air input. Turn counter-clockwise (with a screw-driver) to extract it from its location. Clean with water and soap if necessary. Dry before reassembling.

## 10- Error messages

When the message prompts, the full screen will blink.

Error messages are mainly divided into two types: errors during the operation process and errors during the testing process.

### 10.1 Errors during operation

No.	Warning Code	Definition	Action
1	LEAK_ERR	Leakage warning	During the positioner operating process, there is a leakage in the output pipe system or positioner body output part. Check every joint in the output pipe system connected with the positioner. Check positioner body; Check positioner's sealing joints.
2	INSV_HIG	Input current maximum value	The input current is higher than the setting maximum value.
3	INSV_LOW	Input current minimum value	The input current is lower than the setting minimum value.
4	ZERO_ERR	Valve zero position out of tolerance	Due to external reasons, the positioner's mechanical position can change, which leads to positioner's initial zero position out of tolerance. Check the installation of guide rod and rotating lever. Check the installation state of positioner and actuator. Check the installation of the positioner's support.
5	VALV_ERR	Beyond valve position warning	The valve is out of the setting mini-maxi limit.
6	TIME_ERR	Locating timeout warning	Beyond the setting travel time when every single travel is running. Check the clearance between the guide rod and the rotating lever. Check the actuator's leakage. Check the pressure differential control value. Readjust the positioner.
7	ELEC_ERR	Circuit fault	Contact Genebre, S.A.
8	SENS_ERR	Sensor fault	Check the sensor's line connection.. Check the feedback transmission gear. Readjust the positioner.
9	ACT_ERR	Driving components fault	Check the driver unit's line connection. Readjust the positioner.

## 10.2 Errors during testing

No.	Warning Code	Definition	Action
1	CALC_ERR	Mechanical sticking	Check the installation position and the actuator.
2	BREAK_AU	Parameter setting mistake	Check or give up.
3	OUT_RNG	Beyond sensor range	Adjust scale of the lever (see section 6.1.3).
4	NO_SCALE	No boundary	Check the installation position and the actuator.
5	RNG_ERR	Mechanical travel's mini-maxi value is too small	Adjust scale of the lever (see section 6.1.3).
6	TIME_OUT	Time out	Check or give up.
7	SPR_ERR	Actuator's direction is wrong	Check the installation position and P3-3