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CONFLOW s.p.a.

FLOW CONTROL SOLUTIONS

Instruction and Operating Manual

Smart Valve Positioner

SS2L / SS2R Series

SS2SL / SS2SR Series (SS316)





<Software Version 7.11D>

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1-1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (IEC) Note 1), and other safety regulations.

Note 1) IEC 60079-0 : 2007 EN 60079-0 : 2009 EN 13463-1 : 2009
IEC 60079-11 : 2006 EN 60079-11 : 2007 EN 13463-5 : 2010
IEC 60079-26 : 2004 EN 60079-26 : 2004

Caution **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Danger **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment. The product specified here may become unsafe if handled incorrectly.**
   The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact POWER-GENEX beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

1-2 Safety Instructions

Caution

1. **The product is provided for use in manufacturing industries.**
   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries consult POWER-GENEX beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

Limited warranty and Disclaimer

1. **The warranty period of the product is 1 year in service or 1.5 years after the product is delivered. Note 2)**
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. **For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.**

3. **Prior to using POWER-GENEX products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.**

Note 2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the Deterioration of rubber materials are not covered by the limited warranty.

Compliance Requirements

1. **The use of POWER-GENEX products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.**

2. **The exports of POWER-GENEX products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a POWER-GENEX product to another country, assure that all local rules governing that export are known and followed.**

1-3 Precautions

Be sure to read before handling.

Operation

Warning

1. **Do not operate the positioner outside the specified range as this may cause problems. (Refer to the specifications.)**
2. **Design the system to include a safety circuit to avoid the risk of danger should the positioner suffer failure.**
3. **Be sure that exterior lead-in wiring to the terminal box is based on the guidelines for explosion-protection of manufactory electric equipment when being used as a flame proof, explosion proof construction.**
4. **Do not remove terminal cover in a hazardous location while the power is on.**
5. **Covers for the terminal and body should be in place while operating.**
6. **When using as an intrinsically safe explosion-proof product, do not wire in a hazardous location while the power is on.**

Caution

1. **Do not touch the actuator or valve's oscillating section when supply pressure has been added, as this is dangerous.**
2. **Make sure fingers do not get caught when mounting and aligning the cam.**
   Cut off the pressure supply and always release the compressed air inside the positioner and actuator before performing this work.
3. **Always use with the body cover unit mounted.**
   Moreover, the positioner may not meet degrees of protection IP66 depending on the body cover mounting conditions. In order to meet degrees of protection IP66, tighten threads using the proper tightening torques (2.8 to 3.0 N·m).
4. **Always flush the pipe's inside before piping to ensure foreign objects such as machining chips do not enter the positioner.**
5. **The actuator opening may become unstable when using the booster relay.**
6. **Always use a ground connection to prevent noise from the input current and to prevent damage because of static electricity.**
7. **Use the pressure reading on the supplied pressure gauge as an indication.**
8. **The supplied pressure gauge's needle will malfunction if the pressure supply to the internal mechanism or positioner freezes. Ensure that the pressure gauge's internal parts do not freeze if using the pressure gauge in an operating environment with an ambient temperature of less than 0°C.**

For users

Caution

1. **Assemble, operate and maintain the positioners after reading the operation manual tho-roughly and understanding the content.**

1-4 Precautions

Be sure to read before handling.

Handling

Caution

1. **Avoid excessive vibration or impact to the positioner body and any excessive force to the armature, as these actions may cause damage to the product. Handle carefully while transporting and operating.**
2. **If being used in a place where vibration occurs, using a binding band is recommended to prevent broken wires because of the vibration.**
3. **When exposed to possible moisture invasion, please take the necessary measures. For example, if the positioner is left onsite for long periods, a plug should be put in the piping port and a body cover unit fitted to avoid water penetration.**
   Take measures to avoid dew condensation inside the positioner if exposed to high temperature and humidity. Take enough measures against condensation especially when packing for export.
4. **Keep magnetic field off the positioner, as this affects its characteristics.**

Air Supply

Caution

1. **Use only dehumidified and dust extracted clean compressed air as the air supply.**
2. **Use only dehumidified and dust extracted clean compressed clean air as the positioner contains extra fine orifices such as restrictor and nozzle.**
   Do not use a lubricator.
3. **Do not use compressed air containing chemicals, organic solvents, salinity or corrosive gases, as this may cause malfunction.**
4. **When operating below the freezing point, protect the positioner from freezing.**

Operating Environment

Caution

1. **Do not operate in locations with an atmosphere of corrosive gases, chemicals, sea water, or where these substances will adhere to the regulator.**
2. **Do not operate out of the indicated operation temperature range as this may cause damage to electronic parts and seal materials to deteriorate.**
3. **Do not operate in locations where excessive vibration or impact occurs.**
4. **If the body cover is being installed in a place where the body cover is exposed to direct sunlight, the use of a standard body cover without the LCD window is recommended.**

1-5 Precautions

Be sure to read before handling.

Maintenance

Warning

1. **After installation, repair or disassembly, connect compressed air and conduct tests to confirm appropriate function and leakage.**
   Do not use the positioner when noise from the bleeder sounds louder compared with the initial state, or when it does not operate normally. If these occur, check immediately if assembled and mounted correctly.
   Never modify electrical construction to maintain explosion-proof construction.

Warning-Potential electrostatic charging hazard

1. **The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition capable level of electrostatic charge. Therefore particularly when it used for applications that specifically require Group IIC, EPL Ga equipment, the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.**
2. **The enclosure contains aluminum and is considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction. Particularly, it must not be used for applications that specifically require EPL Ga equipment.**

Caution

1. **The insulation between an intrinsically safe circuit and a frame of the equipment is not capable of withstanding a 500V dielectric strength test as defined in Cl.6.3.12 of EN 60079-11:2007. This shall be taken into account during installation.**
2. **The earthing of enclosure is necessary to maintain Intrinsic Safety because the insulation between an intrinsically safe circuit and a frame of the equipment is not capable of withstanding a 500V dielectric strength test. There are two earthing points on the equipment. One is provided as an internal earthing point inside rear cover of the equipment for attaching of a cable screen. The other is provided as an external earthing point on the left side of the enclosure. Their cross-sectional areas should be capable of carrying the maximum possible current of the equipment.(Generally, an insulated wire having a cross-sectional area of at least 4mm^2 is recommended) The cable should be fitted with a spilt ring lock washer to minimize the risk of self-loosening and is of suitable construction for securing of conductors of cross sections up to 4mm^2.**

1. Introduction

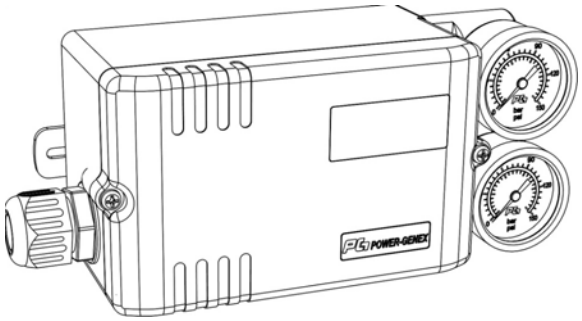
The SS2 series is the intrinsically safe valve positioner that can be used with a control valve in a hazardous area (zone 0, 1) and operated by an electronic board and a relay torque motor with 4~20mA input signals @24VDC power supply.

⚠ Note that a power should be transmitted to the SS2 series though a safety barrier.

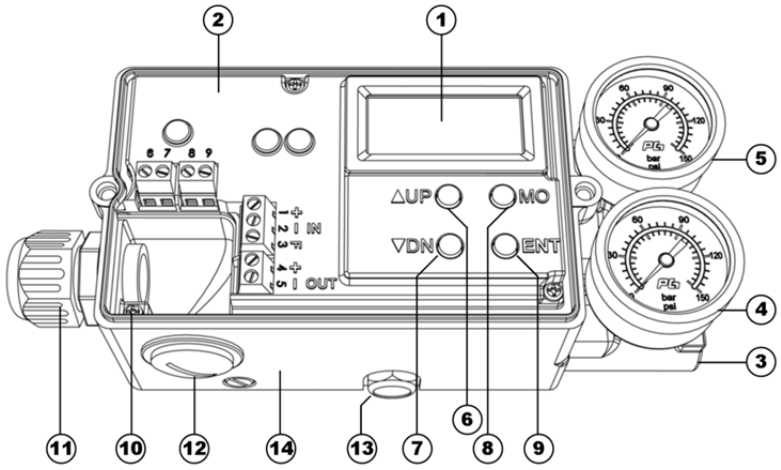
2. Overview of Structure

This product consists of the following parts.

- Electronic card comprised of microprocessor, HART modem and LCD
- Potentiometer for position feedback
- Gauge block



Descriptions of internal parts without cover.



No.	Description
1	LCD
2	Board cover
3	Gauge block
4	Supply air gauge
5	Out 1 gauge
6	▲UP, Up button
7	▼DN, Down button
8	MO, Mode button
9	ENT, Enter button
10	Ground
11	Cable gland (or blind plug)
12	Blind plug (or cable gland)
13	Air venting hole
14	Body

3. Specifications

Input signal	4 - 20 mA @ 24 VDC		
Min. / Max. current	3.6 mA / 50mA		
Voltage drop (impedance)	8.7 VDC (435Ω @ 20mA)		
Intrinsic safety parameters	Input	Ui=28, Ii=93mA, Pi=0.651W, Ci≤23nF, Li =0	
	Output	Ui=28, Ii=93mA, Pi=0.651W, Ci≤22nF, Li =0	
	SPDT	Ui=28, Ii=93mA, Pi=0.651W, Ci=0, Li =0	
Operating angle/ stroke	Linear type: 5 - 130mm * Rotary type: 25 - 120°		
Supply air pressure	1.4 - 7.0 bar (20 - 100 psi)		
Output pressure range	0 - 100% of supply air		
Air flow capacity	80 ℓ/min = 4.8 Nm^3/h = 2.8 scfm (Sup = 1.4 bar) 233 ℓ/min = 14 Nm^3/h = 8.2 scfm (Sup = 6 bar)		
Air consumption	2.8 ℓ/min = 0.17 Nm^3/h = 0.1 scfm (Sup = 1.4 ~ 6 bar)		
Characteristic	Linearity < ±0.3% F.S Hysteresis < 0.2% F.S	Sensitivity < 0.2% F.S Repeatability < 0.2% F.S	
Operating characteristic	Linear, EQ%, Quick open, User set (17 points)		
LCD display	4-digit		
Response speed	1 - 1000 (Min. 1, Max. 1000)		
Scan time	2 ms		
Shut-off value	0 - 10%		
Valve action	Direct acting (DA) / reverse acting (RA)		
Operating temperature	-40℃ ~ +80℃ (-40 ~ +176℉)		
Pneumatic connections	Rc 1/4 or NPT 1/4		NPT 1/4
Electrical connections	G 1/2, NPT 1/2 or M20 x 1.5		NPT 1/2
Explosion proof / protection class	ATEX / IECEx-certified intrinsically safe Ex ia IIC T6/T5, IP66		
	T6 : -40 ~ +40℃, T5 : -40 ~ +80℃		
	Zone 1		Zone 0
Body material / painting	Aluminum die-cast / powder-painted		Stainless steel 316
Weight	1.6 kg		3.9 kg

* For more than 200mm stroke on request

With Communication

Communication	-	HART	PROFIBUS	Foundation Fieldbus
Input signal / Bus voltage	4 – 20 mA @ 24 VDC		9 – 32 VDC	
Min. / Max. Current	3.6 mA / 50mA		-	
Current Consumption	-		15 mA	16 mA
Voltage drop (impedance)	8.9 VDC (445Ω @ 20mA)	9.4 VDC (470Ω @ 20mA)	-	

⚠ Note that the SS2 positioner with Profibus or Fieldbus option is not applicable for intrinsic safety

3.1. Specifications for Profibus PA Communication

Profiles	PROFIBUS Profile for Process Control Devices Version 3.02
Block types	1 AI Function Block 1 AO Function Block 2 DI Function Block 1 Transducer Block 1 Physical Block
Physical layer	In compliance with IEC 61158-2
Transmission rate	31.25 kbit/s
Supply voltage	Bus-powered : 9 ~ 32 VDC
Max. permissible voltage	35 VDC
Power consumption	15 mA
Physical device tag	SSPA
PNO ID number	0x0E19
Bus address	Between 0 and 126, default bus address 126
Certification No.	Z01802
Revision	1.0;SW/FW:01.00;HW:01.00
GSD	PWGX0E19.GSD, File Version: 5.0 pa139710.gsd

3.2. Specifications for Fieldbus Communication

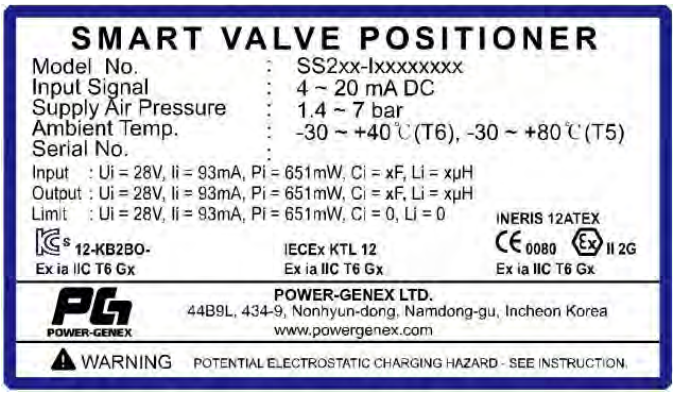
Specification	Foundation ™ Fieldbus Version 2.0
Physical layer	Model 113,121 (IEC 61158-2)
Transmission rate	31.25 kbit/s
Supply voltage	Bus-powered : 9 ~ 32 VDC
Block types	2 AI Function Block 1 AO Function Block 2 DI Function Block 1 Transducer Block 1 Physical Block
Max. execution time	AO block: 31.25 milliseconds
Supply voltage	Power feed from the fieldbus: 9 ~ 32 VDC
Max. permissible voltage	36 VDC
Power consumption	16 mA
Certificate	FF Conformance Test ITK 6.1.1
Device name	PG-SS Positioner
Dev. ID	0003460001_PG-SS_XXXXXXXX
Unit address	Between 10 and 27, default address 247
Class	LM profile 32L, 31PS
Factory default	The PG-SS positioner is not delivered in an aligned state. To adjust the operating range and control parameters, an automatic configuration must be run on the unit. Otherwise, the transducer block remains in out-of-service mode.
Diagnostic functions	Self-diagnostics for the PG-SS pPositioner hardware and software, valve diagnostics with enhanced alarm handling

4. Part Numbering System (order code)

SS2 x x — x x x x x x x x x x

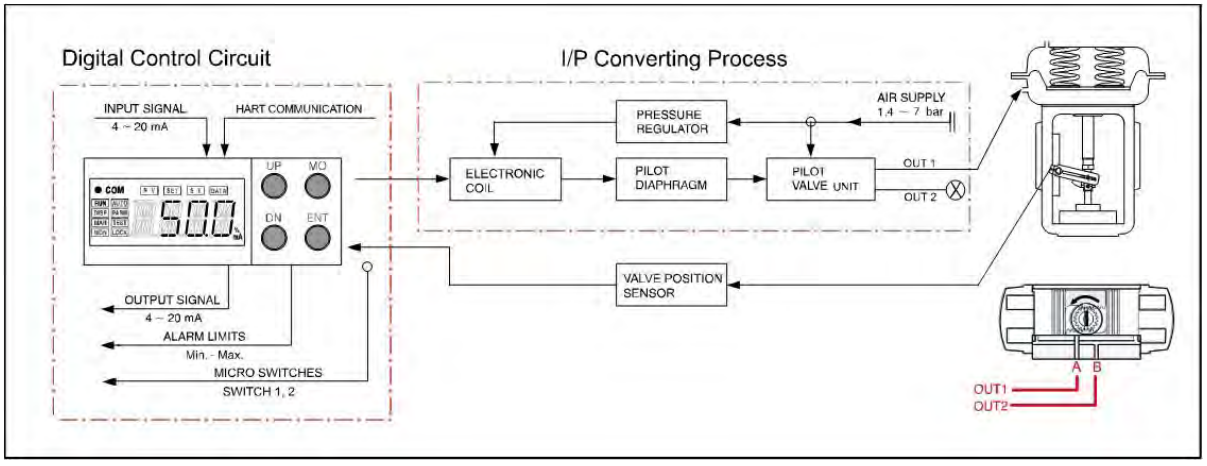
Body material	Aluminum die-cast		
	Stainless steel 316		S
Actuator type	Linear		L
	Rotary		R
Protection class	Intrinsically safe (Ex ia IIC T6/T5)		
	Weatherproof to IP66		
Feedback lever	Linear type	5 ~ 30mm stroke	A
		5 ~ 70mm stroke	B
		5 ~ 130mm stroke	C
		80 ~ 200mm stroke	D
	Rotary type	Fork lever	F
		NAMUR shaft (direct mounting)	N
Pressure Gauge	Not included		0
	6 bar (90psi)		1
	10 bar (150psi)		2
By-Pass	Not included		N
	Yes		Y
Position feedback	Not included		N
	Position transmitter (4~20mA output)		O
	2 x 24VDC software limit switch		L
	2 x micro switch (SPDT)		S
	O + L		M
	O + S		Q
Communication	Not included		N
	HART communication		H
	Profibus PA communication – Not intrinsically safe		P
	Foundation Fieldbus communication – Not intrinsically safe		F
Pneumatic – electrical connections	Rc 1/4 - G 1/2 (standard)		3
	NPT 1/4 - NPT 1/2		4
	Rc1/4 - M20x1.5		5
Mounting bracket	Not included		N
	IEC 60534-6-1 (for SS2L		L
	IEC 60534-6-2(VDI/VDE 3845)(for SS2R)		R
Feedback pin guide	Not included		0
	Included		1
Operating temperature	Low temperature		LT

4.1. Descriptions on Nameplate



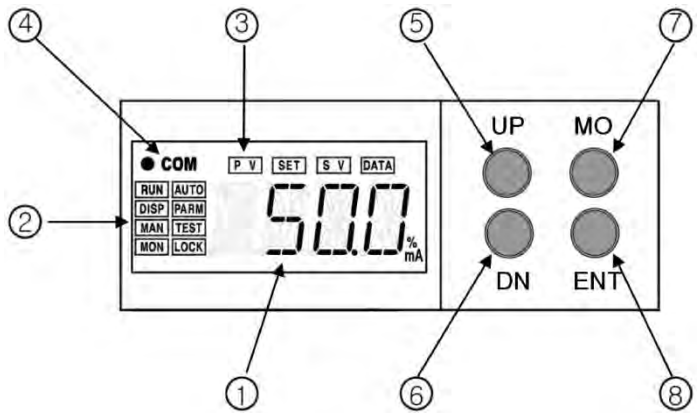
- Model No.: shows the model and the part number selected.
- Input signal: shows 4 – 20mA input signal with 2-wire.
- Ambient Temp.: shows the operating ambient temperate range.
- Serial No. / Date: shows the serial number and the production date.
- Input - Ui , Ii, Ri, Pi, Li, Ci : Intrinsic safety electrical parameters for input
  Output - Ui , Ii, Ri, Pi, Li, Ci : Intrinsic safety electrical parameters for output
  Limit - Ui , Ii, Ri, Pi, Li, Ci : Intrinsic safety electrical parameters for limit switches
- Protection class: shows the explosion proof classifications and approvals.
- Certificate No: shows the certification number.

5. Principle of Operation



If 4-20 mA input signal is supplied, the micro-processor compares input signal with position feedback and sends control signal to the I/P converting module. Pneumatic signal from the I/P converting module operates the valve and the valve stays at the desired position.

6. Descriptions of LCD display and Buttons



① Display of input or output
② Main parameters
③ mA, % display mode
④ Operation of HART
⑤ Up button
⑥ Down button
⑦ Mode button
⑧ Enter button

Press "Mode" button for 5 seconds	• Quick auto-calibration
Press "Up(▲)" button for 5 seconds	• GROP-gain adjustment
Press "Down(▼)" button for 5 seconds	• Span adjustment
Press "Enter" button	• Ambient temperature (℃)

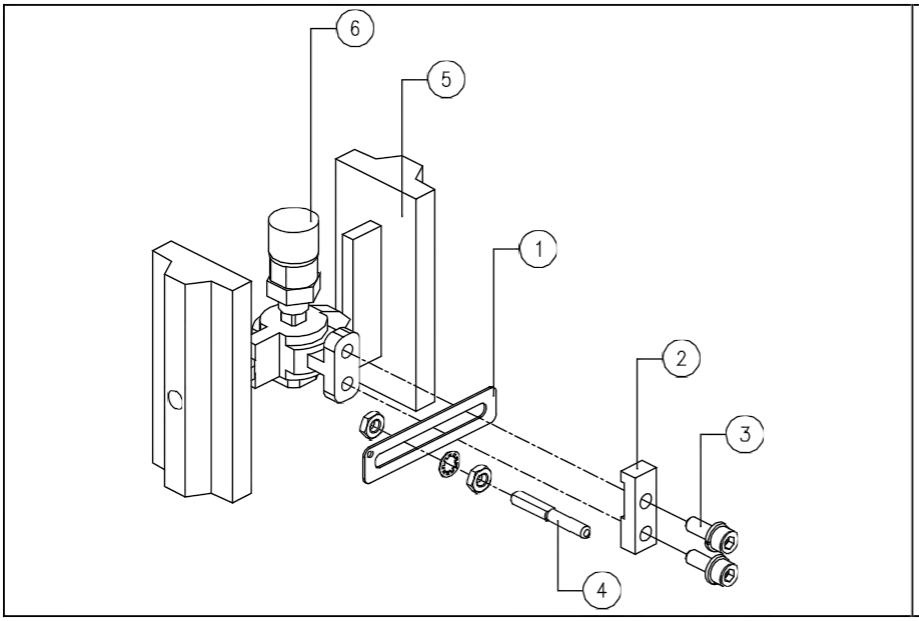
① Display of input or output	• mA, %
② Main parameters	MODE ↔ RUN ↔ DISP ↔ MAN ↔ MON ↔ AUTO ↑ ↔ LOCK ↔ TEST ↔ PARM ↔ ↑
③ Display mode	• Selection of mA, % or in reverse way with values shown (Ex. Reverse : 20% shown → 80% shown)
④ HART communication	• HART communication
⑤ Up (▲)	• UP button
⑥ Down (▼)	• DOWN button
⑦ MO (Mode)	• Selection of running mode • Selection of parameter group or parameter
⑧ ENT(Enter)	• Save of setting values

7. Installation

Be sure to install the air filter regulator before the positioner and check if a supply air pressure is enough to move the valve.

7.1. Mounting onto Linear Actuator

7.1.1. Installation of Follower Guide



① Follower guide

② Clamp plate

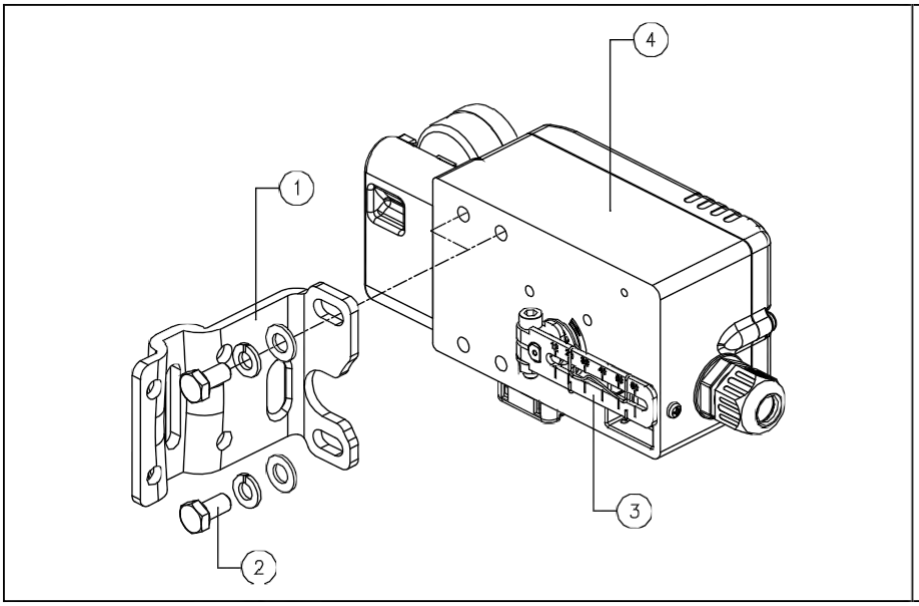
③ Screws(M6)

④ Valve yoke

⑤ Valve stem

7.1.2. Installation of Feedback Lever and Mounting Bracket

Mounting bracket for SS2L positioner is designed to support IEC 60534-6-1.



① Mounting bracket

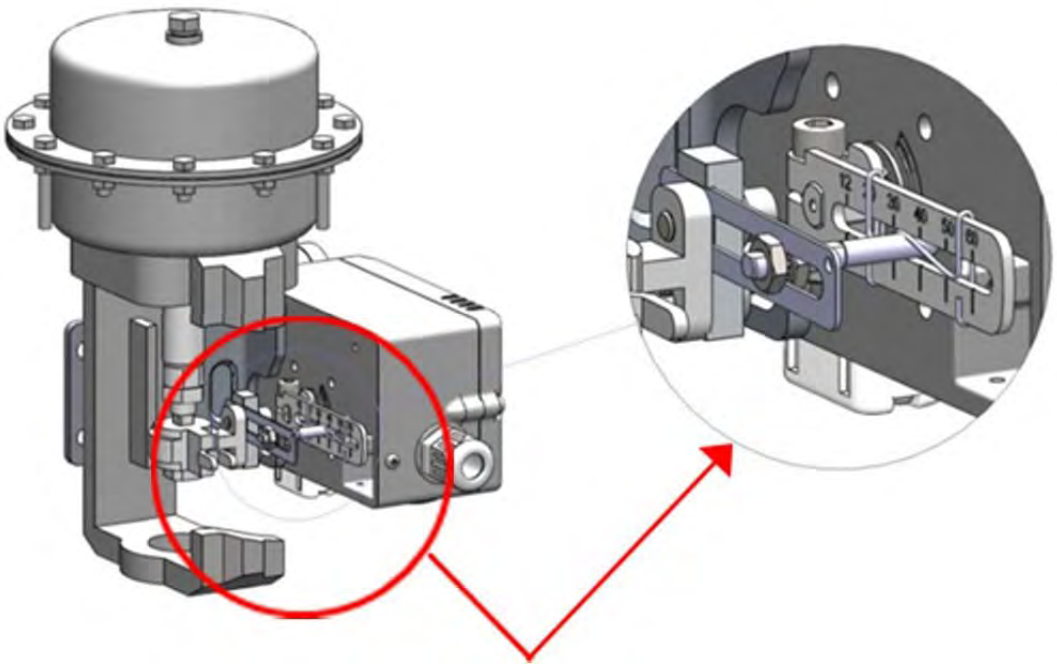
② Screws(M8)

③ Feedback lever

④ SS2L positioner

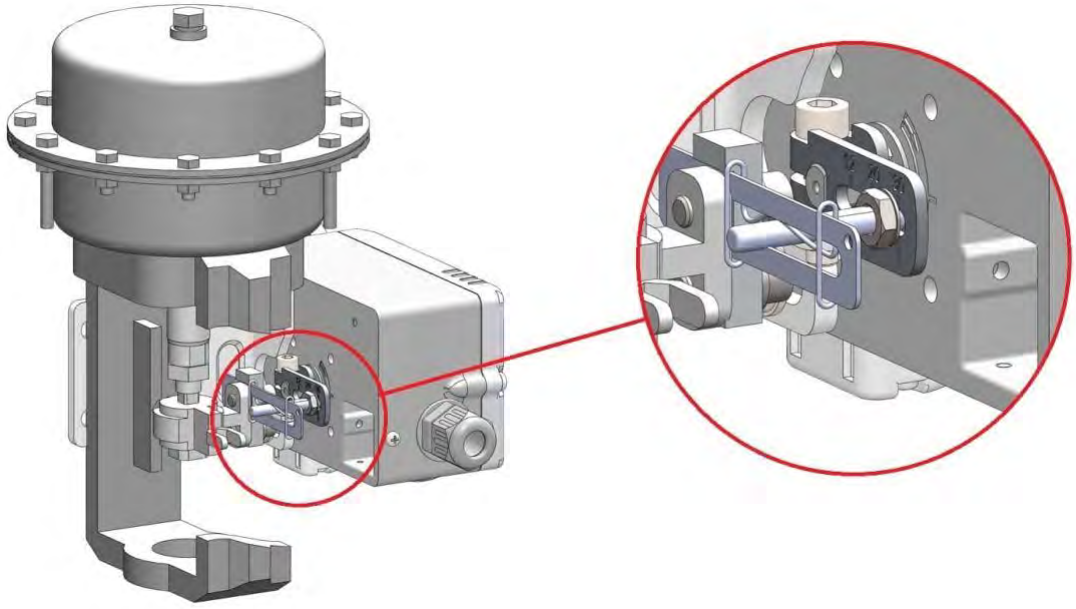
⑤ Feedback pin

A) In case that the feedback lever B, C or D is used



Make sure that the lever spring should be installed on the positioner feedback when the feedback lever B, C or D is used.

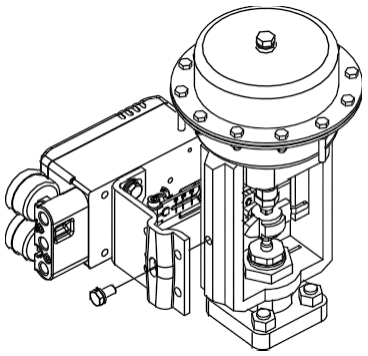
B) In case that the feedback lever A is used

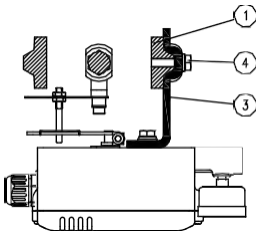


Make sure that the lever spring should be installed on the feedback pin guide lever when the small feedback lever A is used.

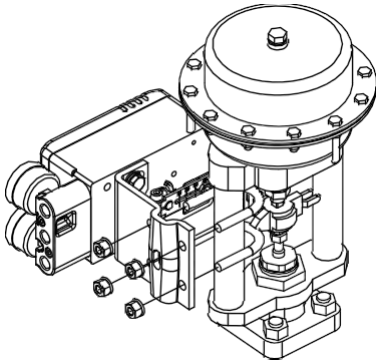
7.1.3. Mounting onto Cast Yoke or Pillar Yoke

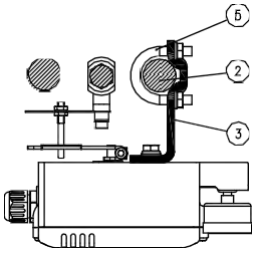
< Cast yoke type >





< Pillar yoke type >





① Cast yoke

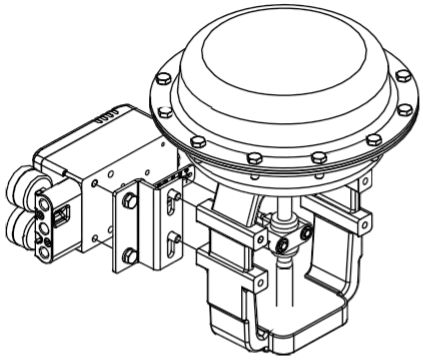
② Mounting bracket

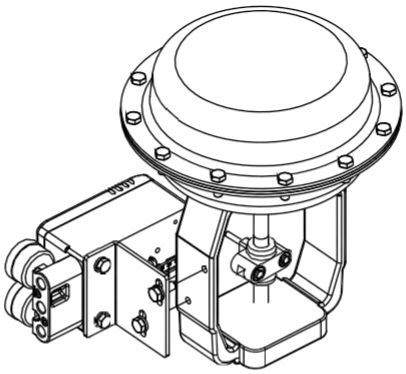
③ Screws(M8)

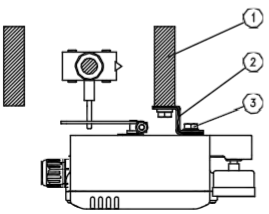
④ U-bolts

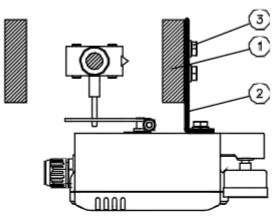
⑤ Pillar yoke

7.1.4. Mounting onto Other Kind of Cast Yoke







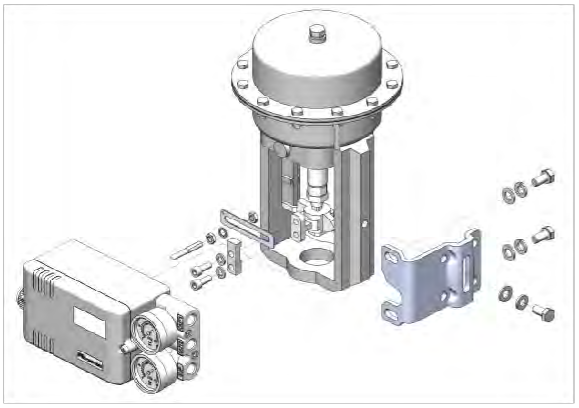


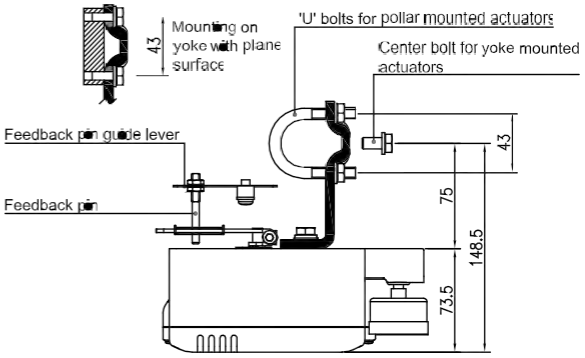
① Cast yoke

② Mounting bracket

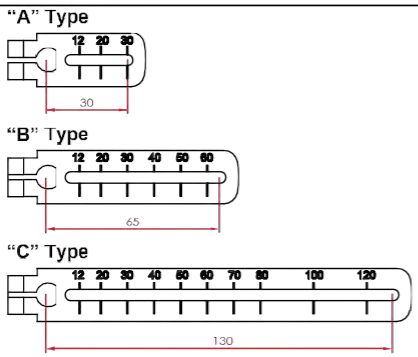
③ Screws(M8)

7.1.5. Mounting on Diaphragm Actuator





Mounting to linear actuators to IEC 60534 6-1



Feedback Lever

Feedback Levers

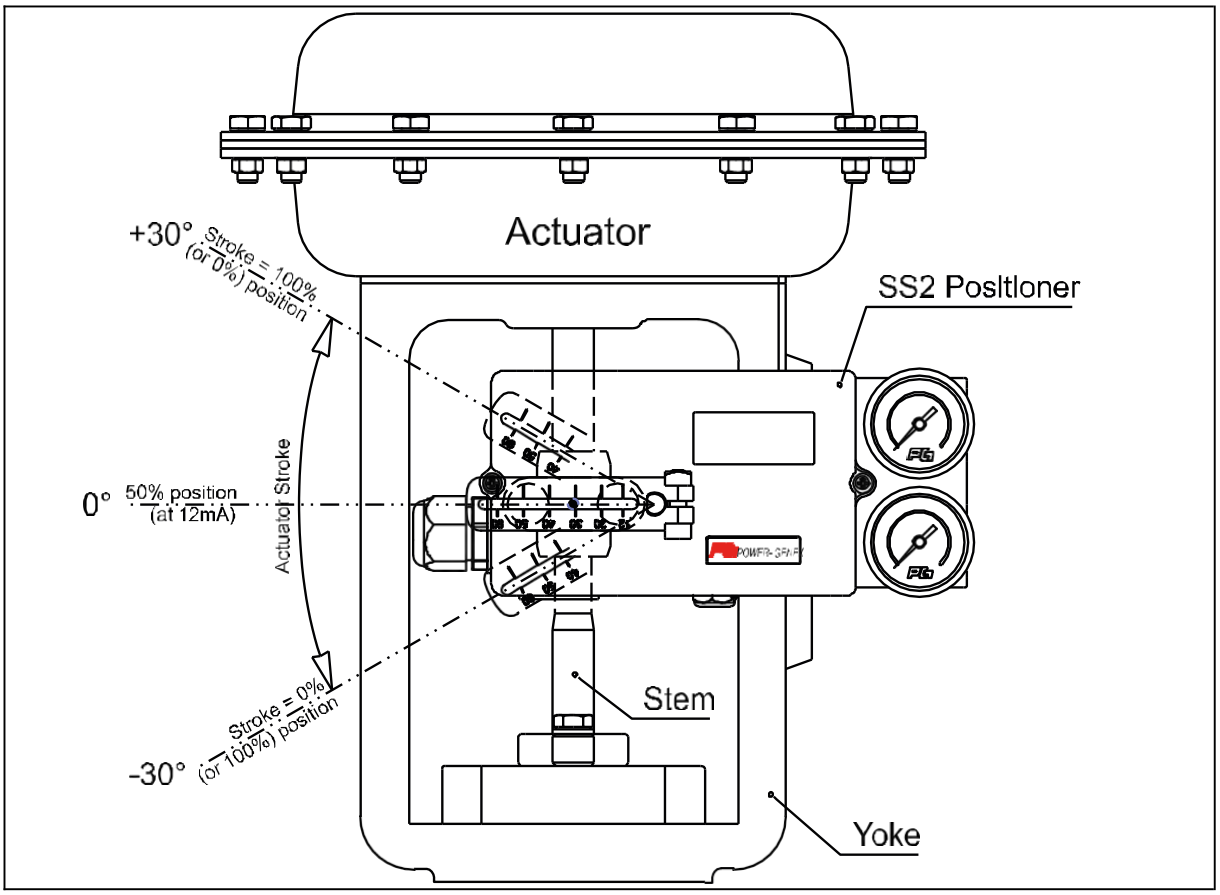
"A" type: 8 ~ 30mm stroke

"B" type: 8 ~ 70mm stroke

"C" type: 8 ~ 130mm stroke

"D" type: 80 ~ 200mm stroke

7.1.6. Standard Installation



① Supply air directly to the actuator, adjust the air filter regulator and set air when the valve reaches to 50% stroke.

② Install the feedback pin at around 30% higher point of the stroke indicated on the feedback lever than the required stroke of the control valve and fix with a screw tightly. For example,

Control valve stroke	Stroke indicated on feedback lever
15mm	20mm
20mm	25mm
30mm	40mm

③ Install the feedback lever horizontally at 50% stroke position.

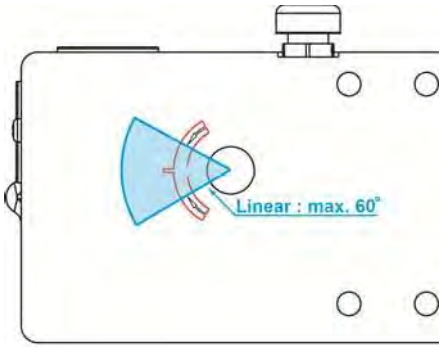
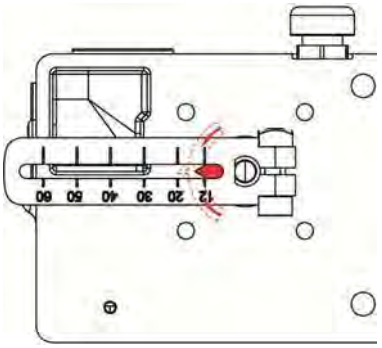
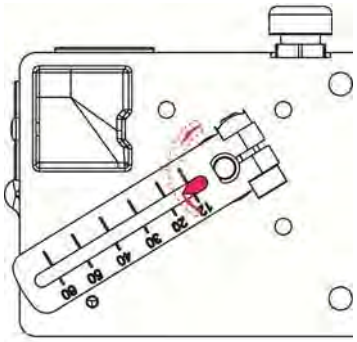
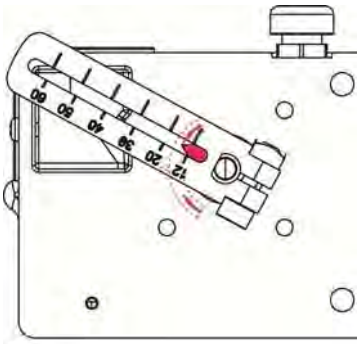
④ If the feedback lever is not installed horizontally, move the mounting bracket up and down little by little so that it can be positioned horizontally.

⑤ Fix the mounting bracket with screws (M8).

⑥ Connect air lines between the SS2L positioner and the actuator and supply air to the positioner and perform auto-calibration by pushing Mode button for 5 seconds.

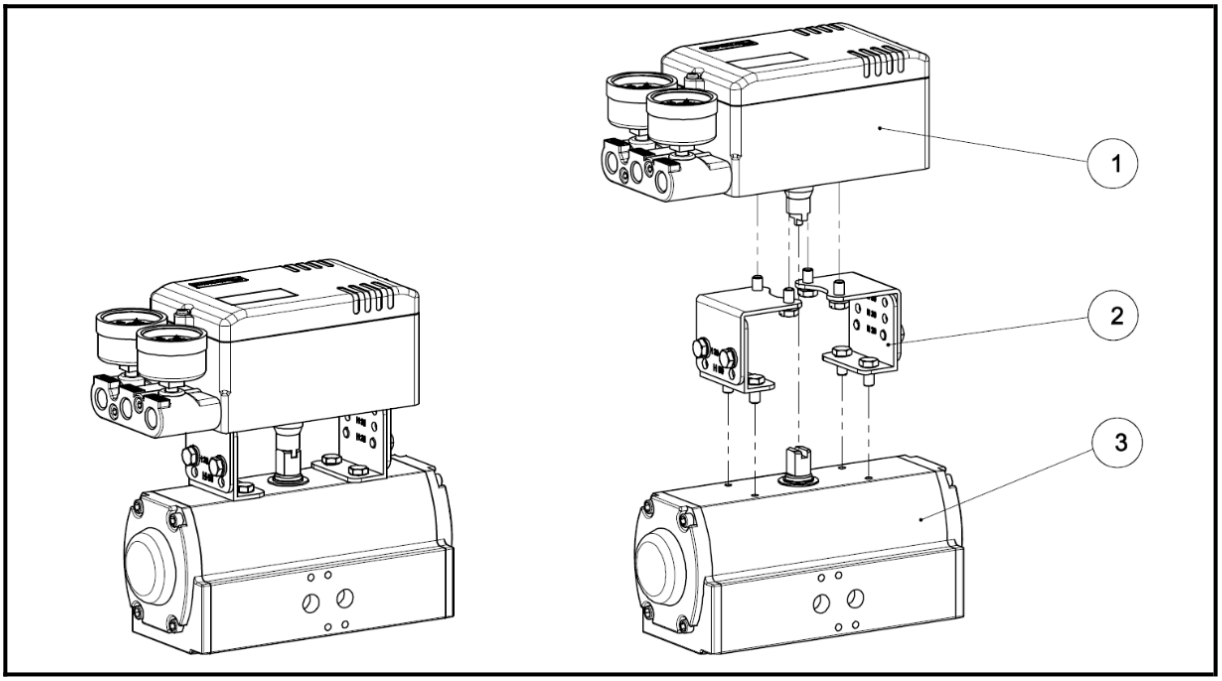
⑦ The operating angle from 0% to 100% stroke should be within the range of ±30°. In case of the over-range of 30°, move the valve stem pin to left or right and make the SS2L positioner stay within the operating angle of ±30°.

Make sure that the SS2L positioner works within the operating range of ±30°. See the below pictures. Otherwise, the error message of 'MONT' appears on LCD and the auto-calibration process fails. Take action as advised in the above ⑦ and get the SS2L positioner feedback lever positioned horizontally at 12mA (50%).

	
<Maximum operating ange : 60°>	<Indicator position at 50%>
	
<Indicator position at 0% (100%)>	<Indicator position at 100% (0%)>

7.2. Mounting onto Rotary Actuator

7.2.1. The SS2R positioner supports NAMUR mounting standard (VDI/VDE 3835, IEC 60534-6-2).



① SS2R positioner ② Multi-size bracket ③ Rotary pneumatic actuator

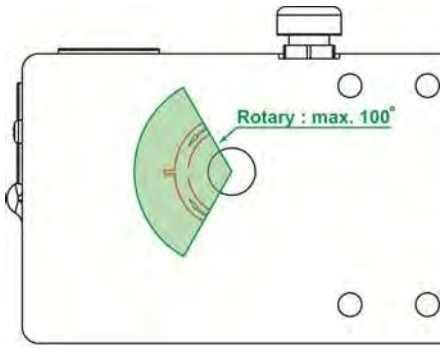
ⓐ Assemble the multi-size bracket to the SS2R positioner with 4 pcs M6 screw. The multi-size bracket is assembled for 80x30x20mm as standard at the factory. If you have other size bracket, see '7.2.4 Re-assembling Multi-size Bracket according to Rotary Actuator'.

ⓑ Mount the SS2R positioner onto the rotary pneumatic actuator with 4 pcs M5 screw.

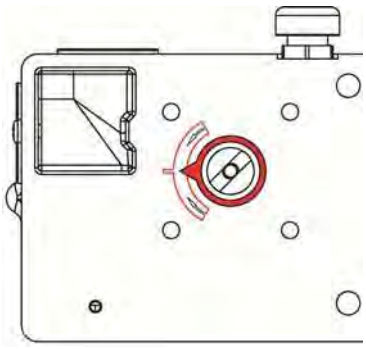
ⓒ Connect air lines between the SS2R positioner and the rotary pneumatic actuator.

ⓓ Perform auto-calibration by pushing MODE button for 5 seconds.

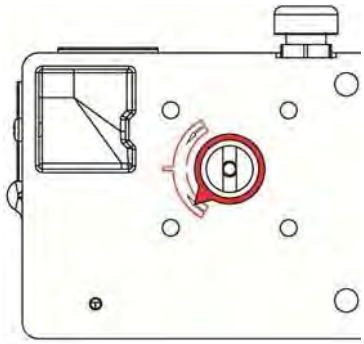
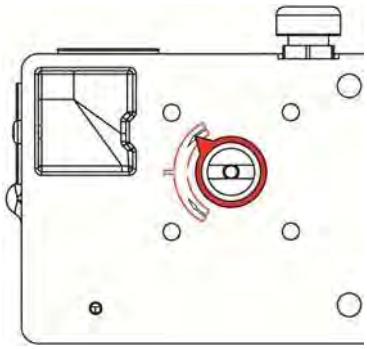
⚠ Make sure that the SS2R positioner works within the operating range indicated on the bottom. See the below pictures. Otherwise, the error message of 'MONT' appears on LCD and the auto-calibration process fails.



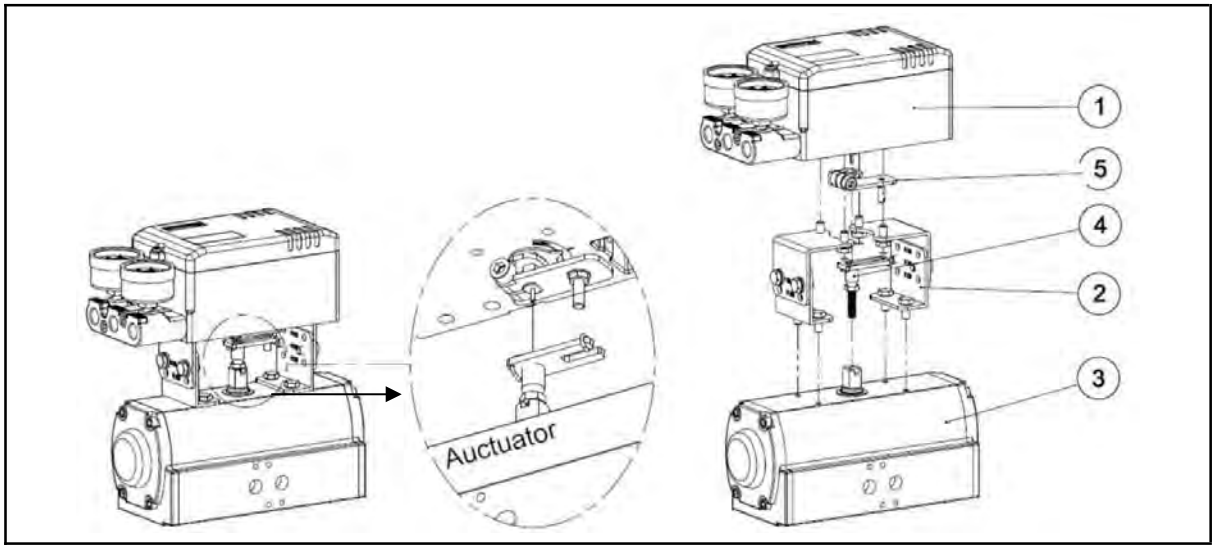
<Maximum operating angle : 100°>



<Indicator position at 50%>

	
<Indicator position at 0% (or 100%)>	<Indicator position at 100% (0%)>

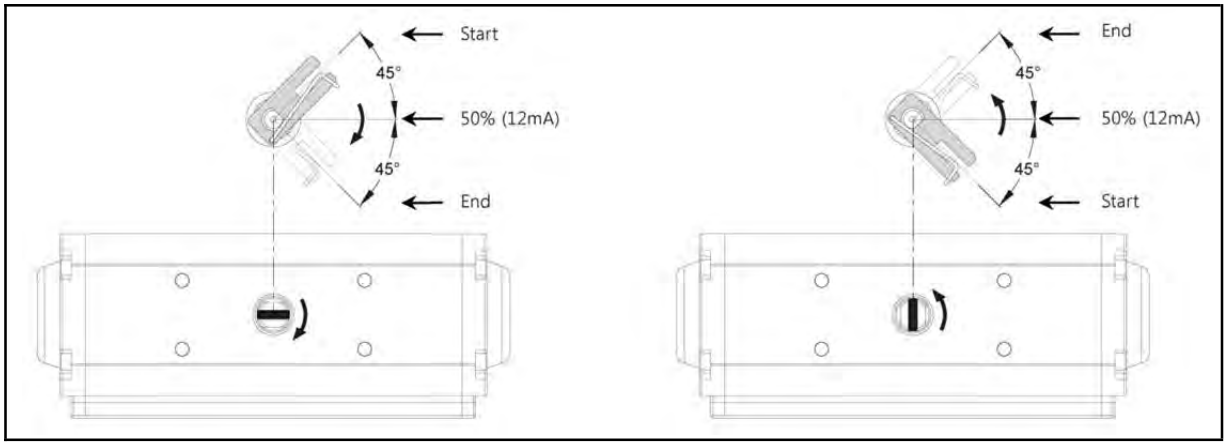
7.2.2. Mounting with Fork Lever Type



① SS2R positioner ② Multi-size bracket ③ Rotary pneumatic actuator

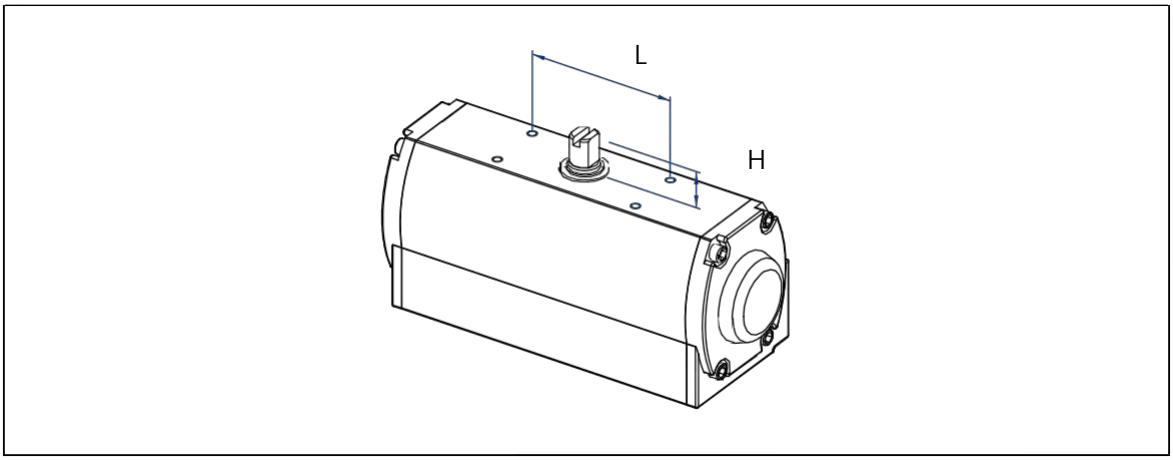
④ Fork lever ⑤ Positioner feedback lever

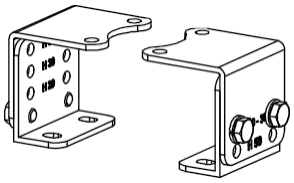
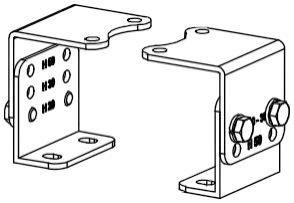
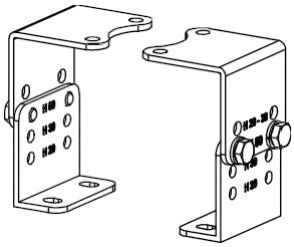
7.2.3. Position of Fork Lever

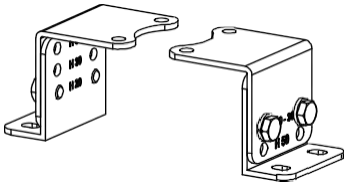
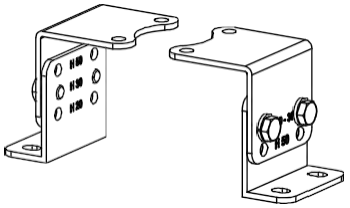
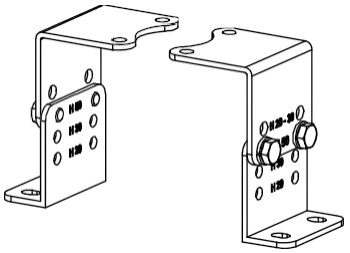


Clockwise movement Counter-clockwise Movement

7.2.4. Re-assembling Multi-size Bracket according to Rotary Actuator



L (mm)	H (mm)	
80	20	
80	30	
80	50	

L (mm)	H (mm)	
130	20	
130	30	
130	50	

Check L and H on the actuator and re-assemble the multi-size bracket to fit your actuator mounting configuration.

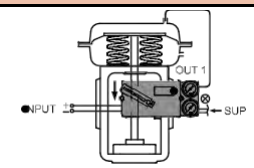
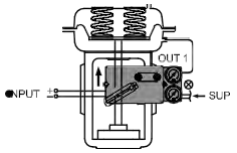
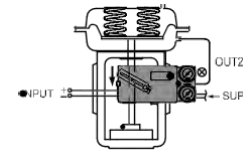
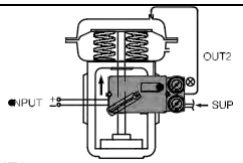
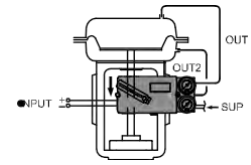
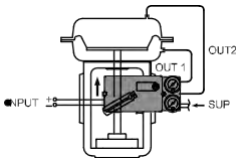
8. Air Connections

① Be sure to install the air filter regulator before the positioner.

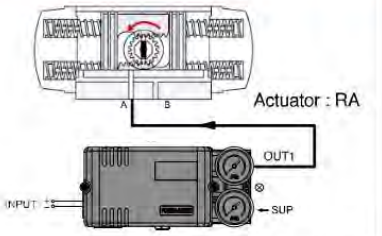
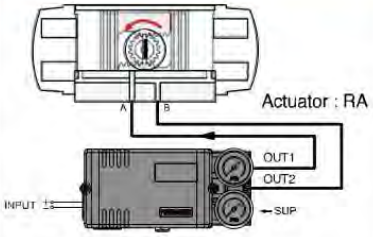
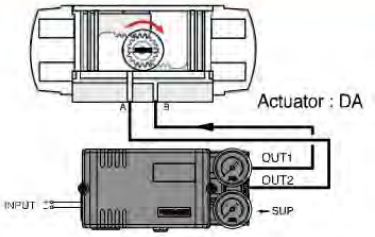
② Supply air should not contain water, oil or moisture.

③ It is recommended to set a supply air pressure 10% higher than the actual operating pressure of the actuator.

8.1. SS2L (linear type)

Direct Acting (DA)		Reverse Acting (RA)	
DA 1 As the input signal increases, Valve stem moves downwards Actuator : DA	 OUT2 must be plugged	RA 1 As the input signal increases, Valve stem moves upwards Actuator : RA	 OUT2 must be plugged
DA 2 As the input signal increases, Valve stem moves downwards Actuator : DA	 OUT1 must be plugged	RA 2 As the input signal increases, Valve stem moves upwards Actuator : RA	 OUT1 must be plugged
DA 3 As the input signal increases, Valve stem moves downwards		RA 3 As the input signal increases, Valve stem moves upwards	

8.2. SS2R (rotary type)

Spring Return	Double Acting	Double Acting
 OUT2 must be plugged		
As the input signal increases, Actuator shaft rotates counter-clockwise	As the input signal increases, Actuator shaft rotates counter-clockwise	As the input signal increases, Actuator shaft rotates clockwise

	Spring Return	Double Acting
Reverse Acting	Out1 : piped, Out2 : plugged	Out1 : piped to Actuator port A, Out2 : piped to Actuator port B
Direct Acting	Out1 : plugged, Out2 : piped	Out1 : piped to Actuator port B, Out2 : piped to Actuator port A

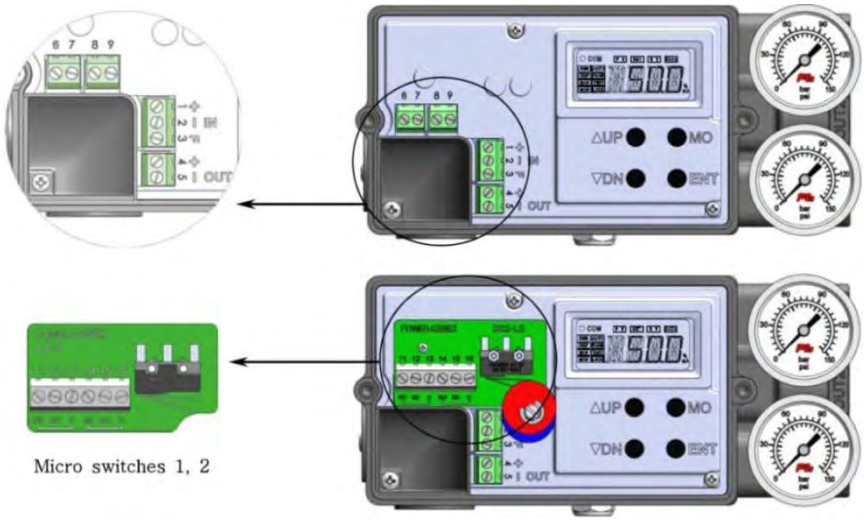
9. Electrical Connections

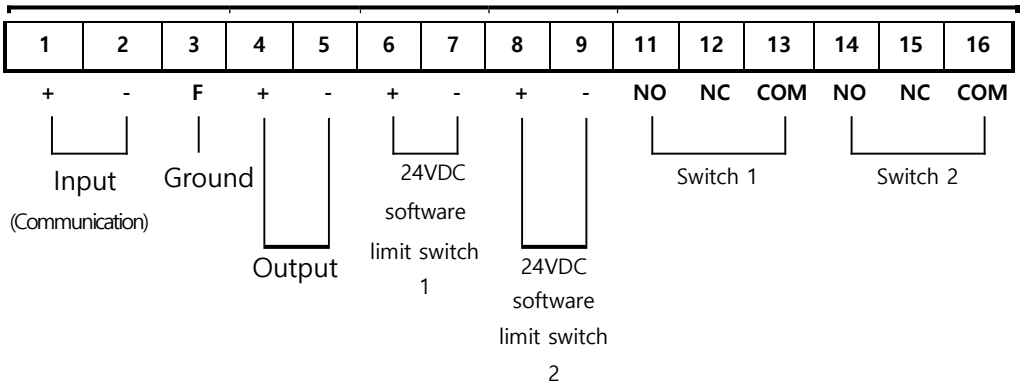
① Be sure to supply the rated voltage and current stated on this manual. Otherwise, it may cause a serious damage or malfunctions.

② Check polarity of + and – exactly and connect wires.

③ When it is necessary to open the positioner cover at a humid place, more attention is required. It may cause a serious damage or malfunctions.

9.1. Terminal Block



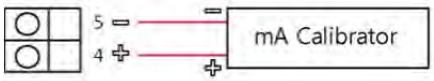


1	+ 4-20mA input signal	HART / Profibus PA / Fieldbus
2	- 4-20mA input signal	
3	Ground	
4	+ 4-20mA output signal	
5	- 4-20mA output signal	
6	+ 24VDC software limit 1	
7	- 24VDC software limit 1	
8	+ 24VDC software limit 2	

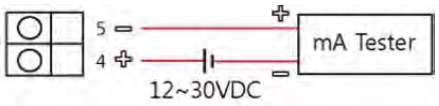
9	- 24VDC software limit 2
11	Switch 1 NO
12	Switch 1 NC
13	Switch 1 COM
14	Switch 2 NO
15	Switch 2 NC
16	Switch 2 COM

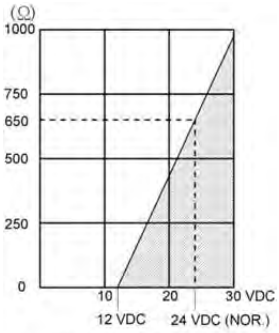
9.2. Measuring Output Signal

9.2.1. With mA loop calibrator



9.2.2. With multi-meter



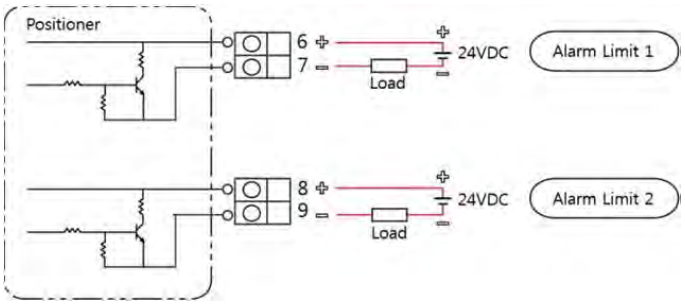


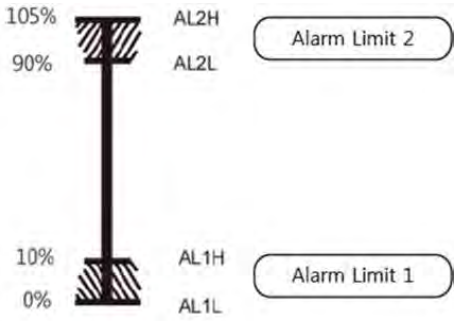
Transmitter Load Limitation

Position Transmitter Specifications	
Output signal	4 – 20mA, 2-wire
Power supply	12 – 30 VDC
Output current limit	30mA DC
Linearity	±0.75% F.S
Operating temperature	-20 ~ +80℃

Zero and span of position feedback (4-20mA output signal) are set automatically during auto-calibration process.

9.3. Wiring 24VDC Software Limit Switches (only weatherproof to IP66)





Alarm Limit Factory Setting

24VDC should be supplied for software limit switches.

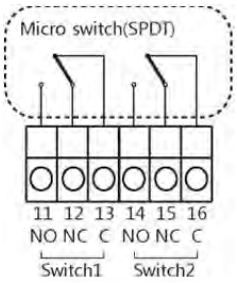
9.4. HART Connection

Note that wires for HART communication should be connected to terminals No. 1 and No. 2 together with wires for input signals. For reference, there is no distinction in + and – between HART wires.

9.5. Profibus PA / Fieldbus Connection

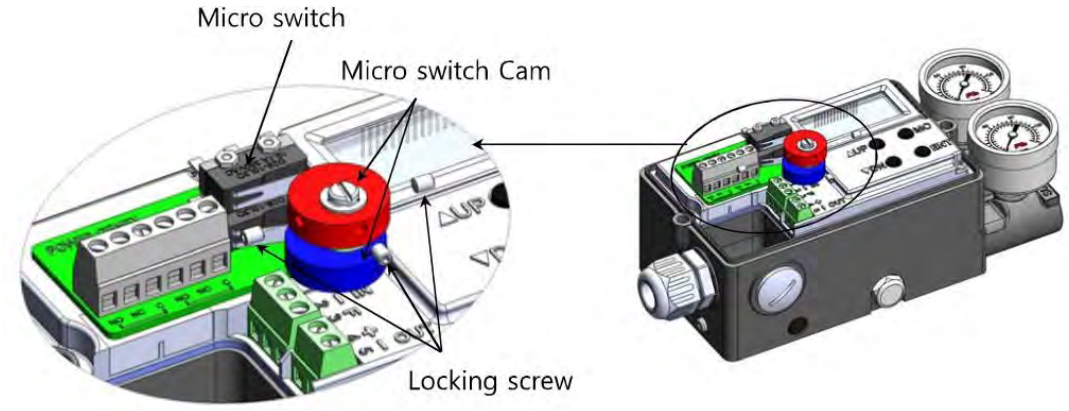
Make sure of + and – when connecting wires.

9.6. Wiring SPDT Micro Switches



Micro Switch Specifications	
Type	SPDT
Rating code	10.1A @ 250 VAC
Operating temperature	-25 ~ +85℃

9.7. Setting Micro Switches



After auto-calibration process, turn the micro switch cams clockwise slowly and check the contact points.

After checking the contact points of the micro switches at a desired position, fix with screws.

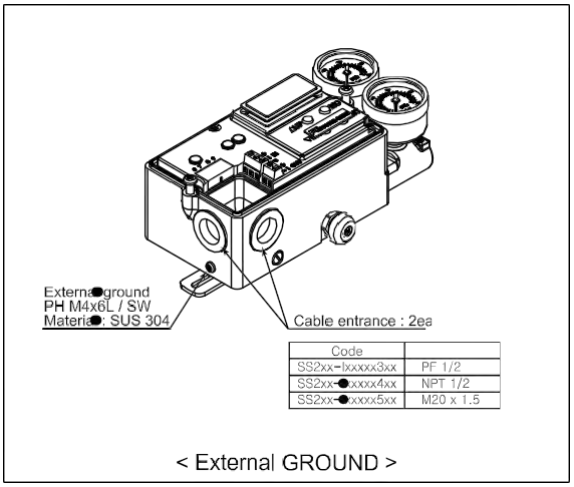
For reference, upper switch 1: No. 11, 12, 13 / lower switch 2: No. 14, 15, 16

9.8. Earthing

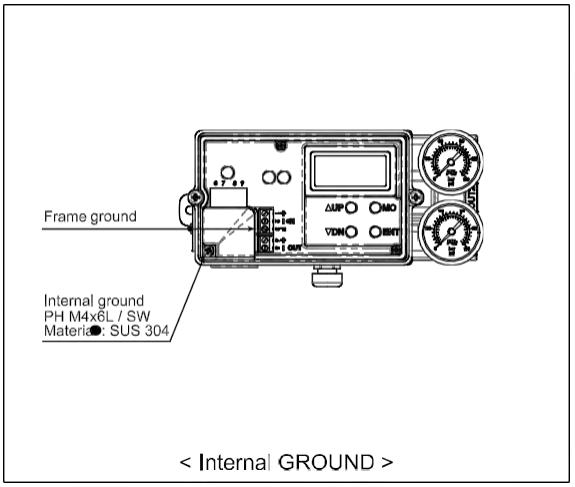
The earthing of enclosure is necessary to maintain Intrinsic safety because the insulation between an intrinsically safe circuit and a frame of the equipment is not capable of withstanding a 500V dielectric strength test. There are two earthing points on the equipment. One is provided ad an internal earthing point near terminal compartment inside the equipment. The other is provided as an external earthing point on the side of the enclosure.

Their cross-sectional areas should be capable of carrying the maximum possible current of the equipment. (Generally, an insulated wire having a cross-sectional area of at least 4mm^2 is recommended)

To be suitable for securing of conductors, the cables should be fitted with ring spring lock washers to minimize the risk of self-loosening.



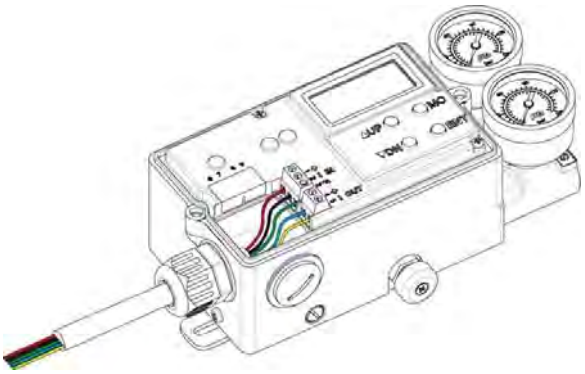
< External GROUND >

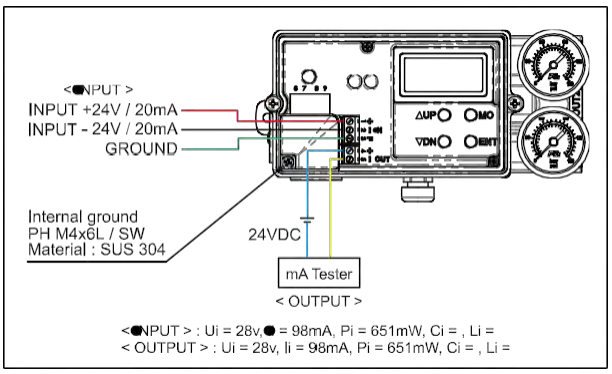


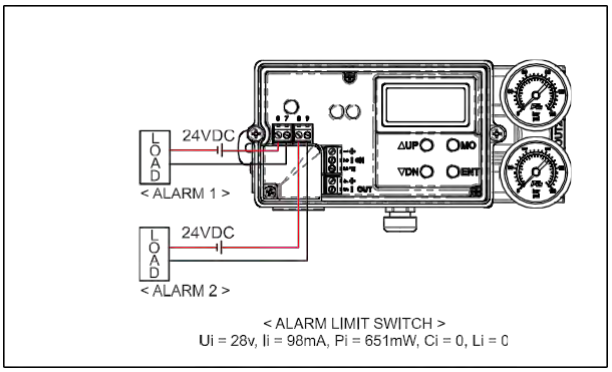
< Internal GROUND >

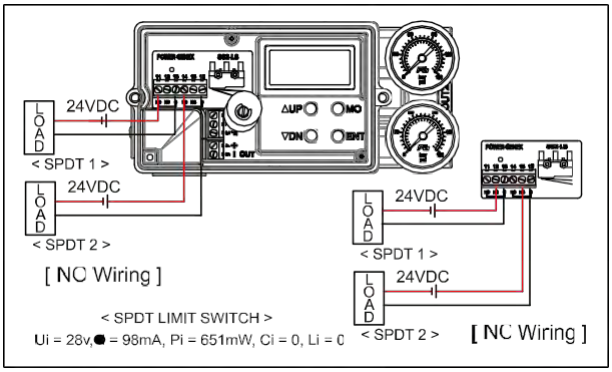
9.9. Wiring for Intrinsic Safety

The SS2L / SS2R positioner is designed to meet the intrinsic safety standards of IEC/EN 60079-0, IEC/EN 60079-11, EN 13463-1, EN 13463-5. But the SS2L / SS2R positioner can be affected by the electrical or magnetic energy from other electric products. So please make a note of the instructions below.









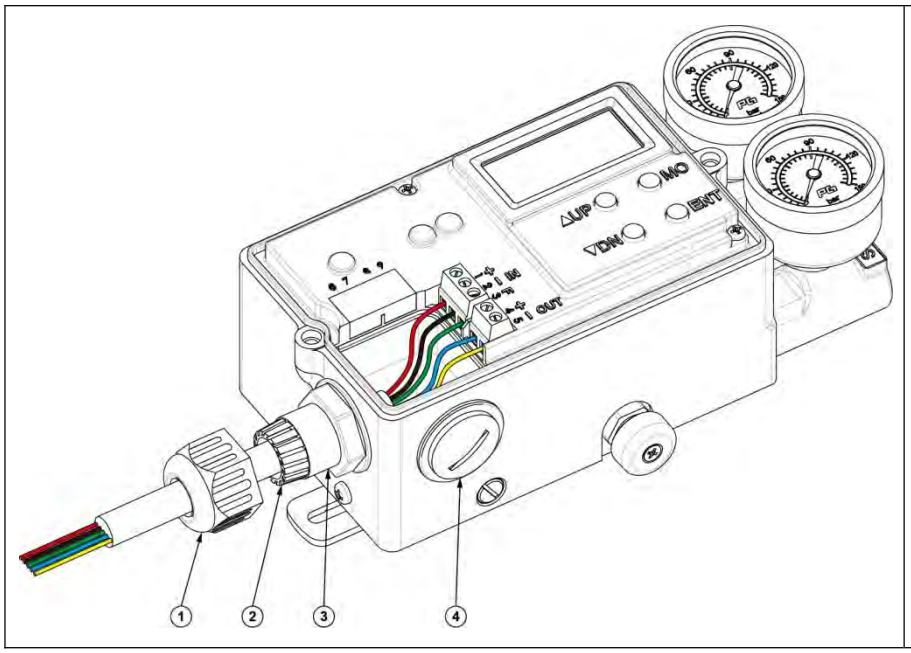
Input signal: 4~20mA@ 24VDC 2wire [red(+), black(-)]
Frame Ground: Green
Output signal: 24VDC 2wire [blue(+), yellow(-)]
2 x Software limit switch: 24VDC
2 x SPDT limit switch: 24VDC

1. Distinguish the intrinsic safety circuit and the non-intrinsic safety circuit, and separate the intrinsic safety circuit from other electrical circuit.
2. Install the proper safety device to block the static or electromagnetism.
3. If possible, minimize inductance and capacitance of wires. If the operating conditions are specified, try to keep inductance and capacitance as low as possible.
4. Protect wires from the external damage.
5. Ground in order to meet the operating regulations of the installation area.

1) The electronic card and the internal coils can be damaged in case of the input signals improper to the specifications of the SS2L / SS2R positioner.
2) The SS2L / SS2R positioner doesn't work in case of a wrong connection of '+' and '-'. Be sure to check the proper terminals before connection.
3) Ground internally and externally, if possible.
4) Try to keep the intrinsic safety parameters of the SS2L / SS2R positioner as low as possible.(Ui, Ii, Ci, Li)
5) Be sure to install the safety barrier between the SS2L / SS2R positioner and a power supply source.

9.10. Cable Gland / Blind Plug

9.10.1. Cable Gland



1. Cable Gland Cover
2. Cable Gland Sealing
3. Cable Gland Body
4. Blind Plug

1. The cable gland is installed as above before delivery. Change the positions of the cable gland and the blind plug for installation on other side.
2. Turn the cover of the cable gland counter-clockwise to open, and insert wires.
3. Connect wires to terminals and tighten the cable gland.

1) Use the cable with diameter of Max. Ø 12.5 to Min. Ø 9.

2) Be sure to disconnect a power supply before the above process.

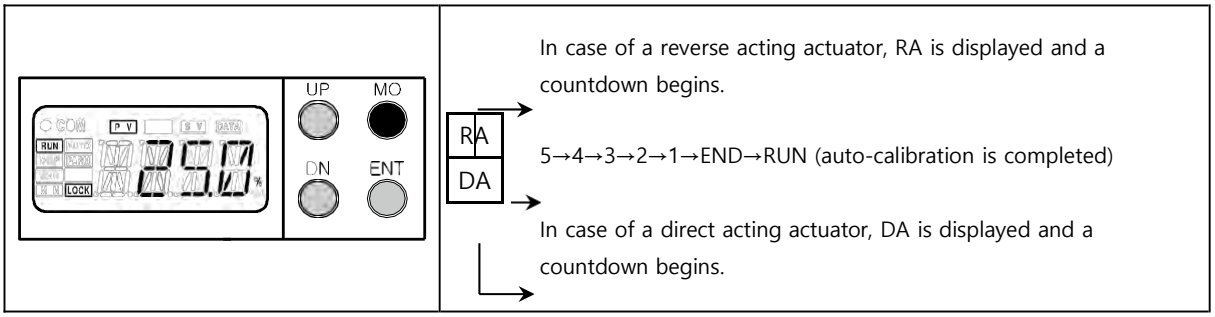
9.10.2. Blind Plug

1. Use the blind plug for the cable entry not used.
2. Install or dis-install the blind plug with the "–" screw driver.

10. Quick Auto-Calibration

10.1. Quick Auto-Calibration

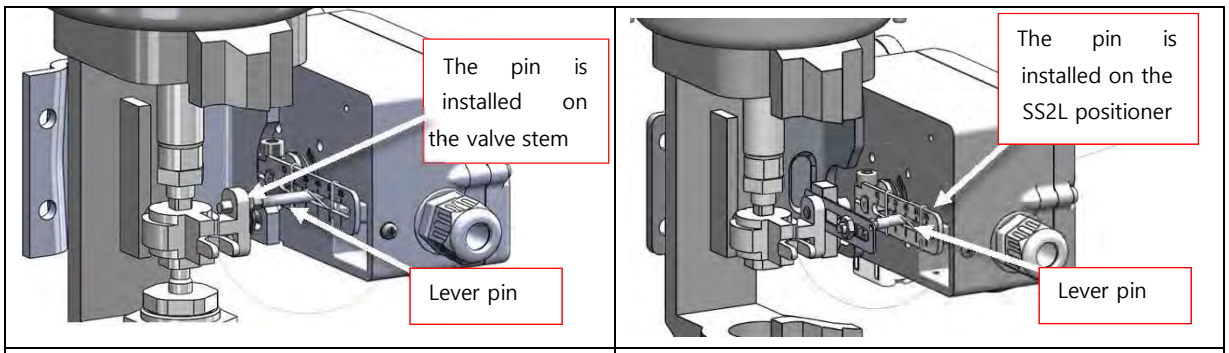
Supply 4-20mA input signal and push the MODE button for 5 seconds, the auto-calibration process will start.



① It may take a longer time according to sizes of the control valve and the actuator. Generally, it will take 2 – 3 minutes with the standard size valve and actuator.

② If "MONT" is shown with the linear type SS2L positioner during an auto-calibration process, please make sure that the feedback lever is positioned horizontally at 50% open or close (See 11.4.6). Otherwise, please mount the SS2L positioner again.

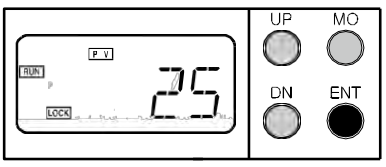
- In case of the linear type SS2L positioner, "VALP / POSP" is shown as below. Please choose either VALP or POSP within 6 seconds by pushing the UP/DN button. Otherwise, "VALP" is set as standard.



VALP (VALVE PIN)	POSP (POSITIONER PIN)

⚠ **Note that if there is a difference between a selection of "VALP" or "POSP" and an actual installation of pin, it may cause a poor linearity.**

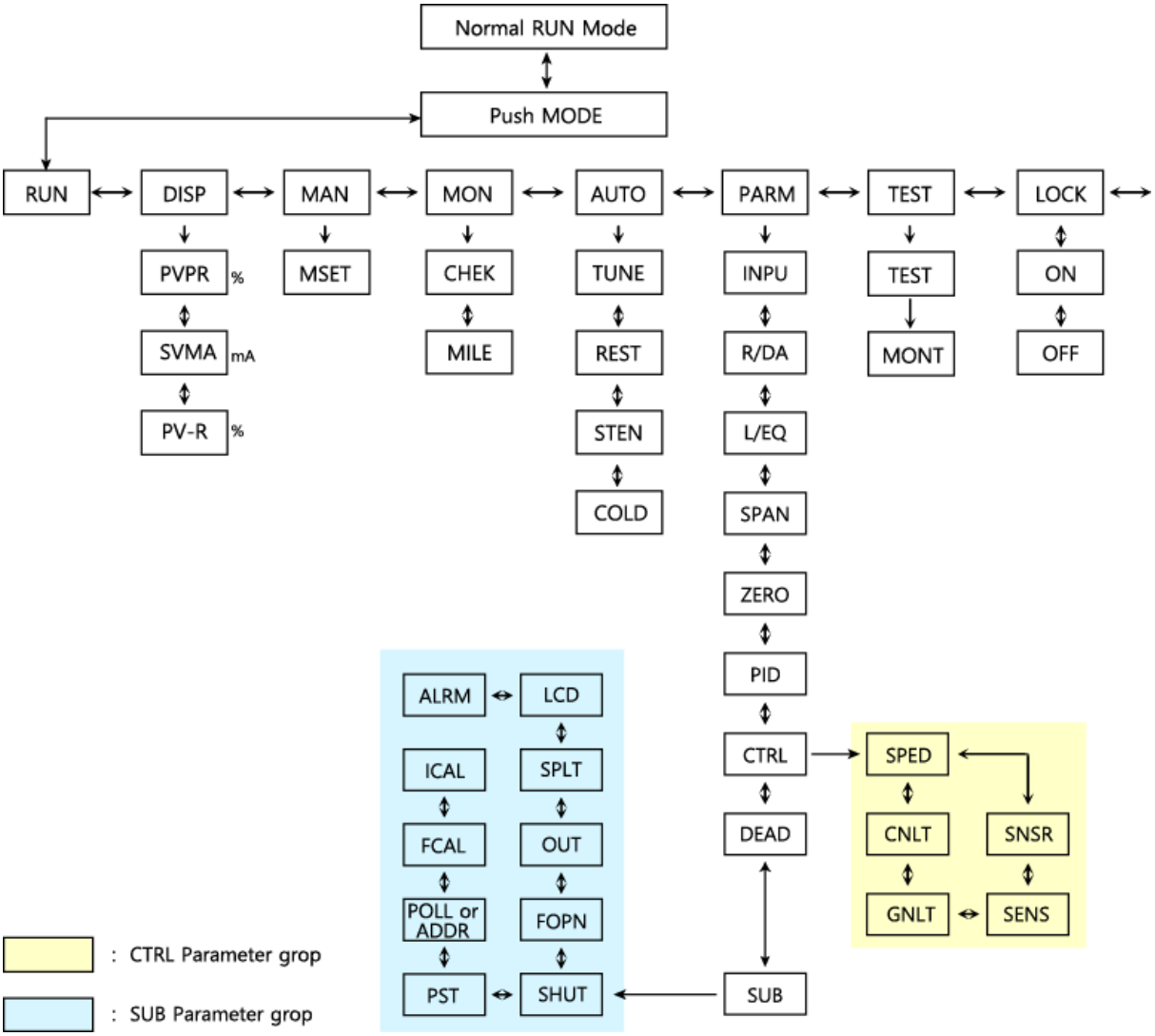
10.2. Checking the Ambient Temperature



Keep pushing ENTER button, an ambient temperature surrounding the positioned will appear. Note that this ambient temperature appears only while pushing ENTER button.

11. Description of Parameters Flow

11.1. Diagram of Parameters



Note that the PST function (Partial Stroke Testing) is loaded at the factory on demand only when requested.

11.2. Main Parameters

Ref.	Parameter	Description	Function
11.4.2	DISP	DISPLAY	changes the LCD display mode
	PVPR	PV % value	shows the current position by %
	SVMA	Input signal mA value	shows the input signal by mA
	PV-R	PV % value (reversed value)	shows the current position by % in a reverse way (Ex. PVPR – 10% → PV-R – 90%)

Ref.	Parameter	Description	Function
11.4.3	MAN	MANUAL	operates the valve manually
	MSET	MANUAL-SET	operates the valve manually

Ref.	Parameter	Description	Function
11.4.4	MON	MONITOR	checks the current status of the positioner
	CHEK	ERROR CHEK	checks the errors occurred to the positioner
	MILE	Runtime	checks the total valve runtime

Ref.	Parameter	Description	Function
11.4.5	AUTO	AUTO-SET	performs auto-calibration and return to the factory settings
	TUNE	Auto-calibration	performs auto-calibration
	REST	RESET	returns to the factory settings
	STEN	START - END	re-sets the position of Zero and Span
	COLD	COLD START	re-boots the positioner

Ref.	Parameter	Description	Function
11.4.6	PARM	Sub-parameters	Please see the parameters on next page

Ref.	Parameter	Description	Function
11.4.7	TEST	TEST MODE	tests the positioner
	MONT	Checking of mounting status	confirms the mounting status of the positioner

11.3. Parameters

11.3.1. Main Parameters

Ref.	Parameter	Description	Function	Default
11.5.1	INPU	Input signal	4...20mA or 20...4mA	4...20mA
11.5.2	R / DA	RA / DA	Reverse acting or direct acting	RA
11.5.3	L / E.Q	Characteristic	Linear, E.Q. % (1:25 or 1:50), Quick open or User set (17points)	Linear
11.5.4	SPAN	Span adjustment	0...100%	100%
11.5.5	ZERO	Zero adjustment	0...99%	0%
11.5.6	PID	P-GN / I-GN / D-GN		Auto-set
11.5.7	CTRL	Control paraeters	See 11.3.2 CTRL	-
11.5.8	DEAD	Signal dead band	0...9.99%	0.3%
11.5.11	SUB	Sub-Parameters	See 11.3.3 SUB	-

11.3.2. CTRL - Parameters (speed control adjustment)

Ref.	Parameter	Description	Function	Default
11.5.7.A	SPED	Response speed	0...1000	1000
11.5.7.B	CNLT	CONTROL LIMIT		AUTO
11.5.7.C	GNLT	GAP LIMIT		AUTO
11.5.7.D	SENS	SENSITIVITY		MIDD
11.5.7.E	SNSR	SENSOR SETTING		EXPA

11.3.3. SUB - Parameter

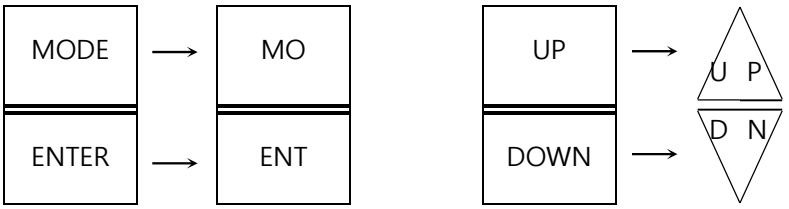
Ref.	Parameter	Description	Function	Default
11.5.9.A	SHUT	Shut-off	0...9.9%	0.3%
11.5.9.B	FOPN	Full-open	0...9.9%	0.3%
11.5.9.C	OUT	Output signal	4...20mA or 20...4mA	4...20mA
11.5.9.D	SPLT	Split range	4...12mA or 12...20mA	4...20mA
11.5.9.E	LCD	Change of display position	FOR / REV	FOR
11.5.9.F	ALAM	Software limit low, high	AL1L / AL1H, AL2L / AL2H	0...10%, 90...105%
11.5.9.G	ICAL	IN4M / IN20	sets the values in accordance with 4~20mA input signals	Factory setting
11.5.9.H	FCAL	FB4M / FB20	sets the values in accordance with 4~20mA output signals	Factory setting
11.5.9.I	POLL	HART polling address	0...15	0
11.5.9.J	PST	Partial stroke testing	checks a valve status	OFF
11.5.9.K	ADDR	PROFIBUS address	0...125	126



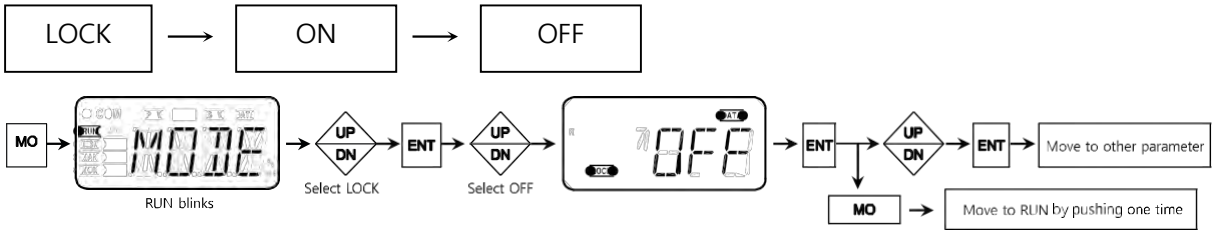
Note that the PST function (Partial Stroke Testing) is loaded at the factory on demand only when requested.

11.4. Setting of Main Parameters

The following abbreviations will be used hereafter.



11.4.1. LOCK ON / OFF

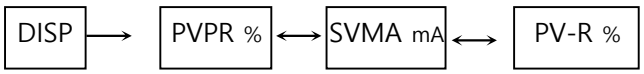


① LOCK ON : Saves all setting values.

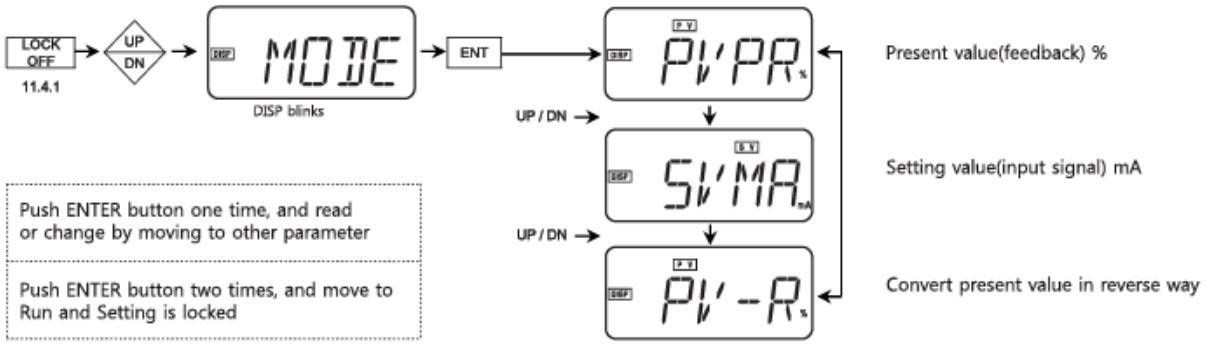
② LOCK OFF : Be sure to LOCK OFF when it is necessary to read or change the selected parameters and the saved setting values.

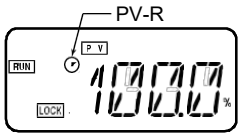
③ Quick auto-calibration, Span, P-Gain can be carried out without LOCK Off (see "10. Quick Auto-calibration")

11.4.2. Display Mode



Selection of mA, % or in reverse way with values as shown



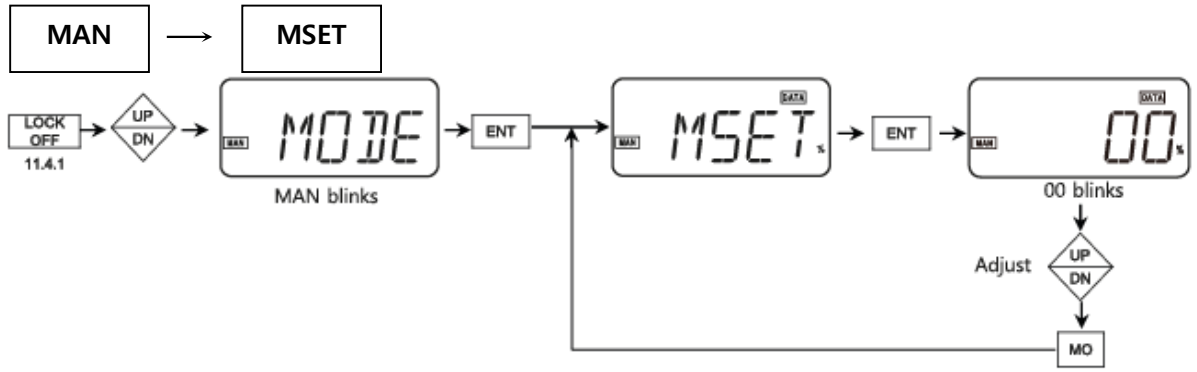


If PV-R is selected, the small point will blink as shown to the left.

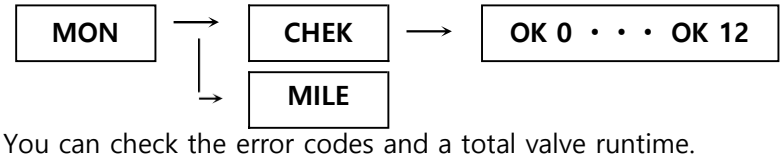
Present value(PV) or setting value(SV) is displayed with mA or %. Setting value stands for input signal. If a control valve is a direct acting type and it is necessary to see the feedback values in a reverse way, select PV-R.

11.4.3. Manual Mode (default: 0)

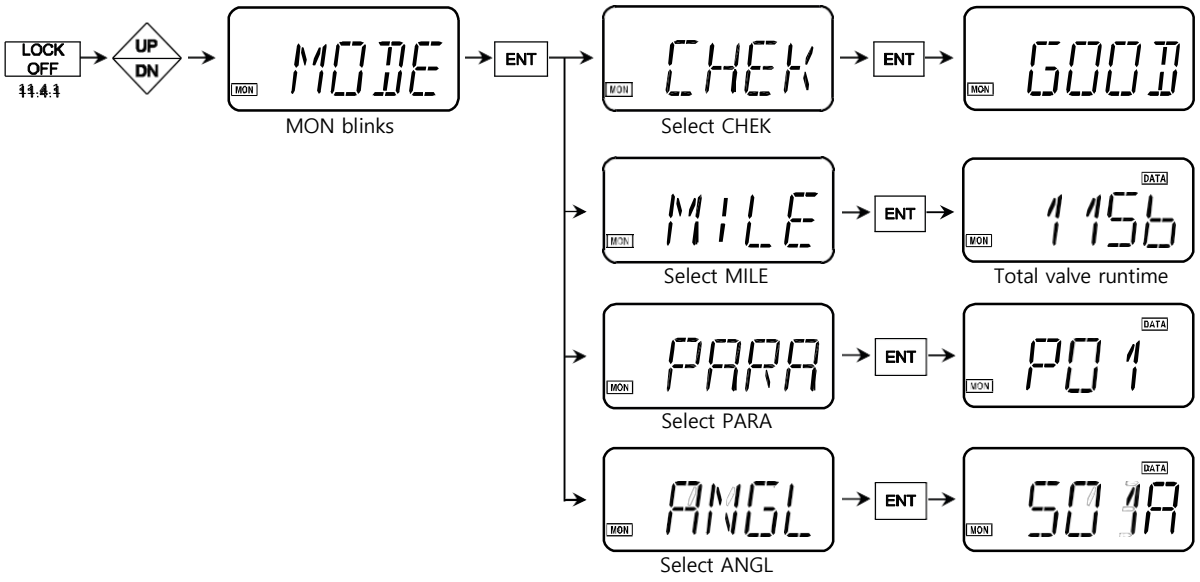
The valve can be moved to 0 – 100% manually.



11.4.4. Monitor Mode



You can check the error codes and a total valve runtime.



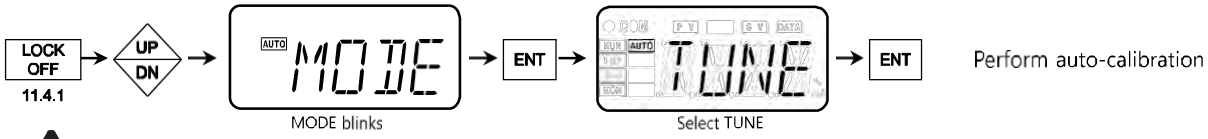
Number 1 in MILE corresponds to 10 hour. For example, if 1156 appears, it means that this valve has been working for 11,560 hours.

11.4.5. Auto-Calibration Mode



If necessary, initialize all setting values to the original values set after auto-calibration or return them to the factory setting values.

11.4.5.A. Performing Auto-Calibration



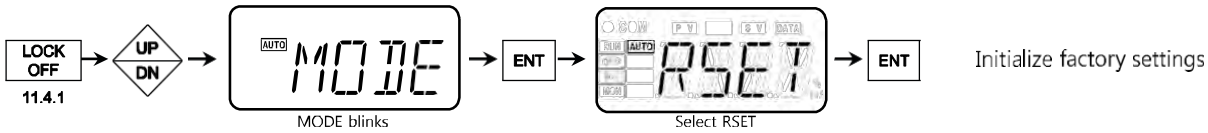
① Reverse acting (RA) is a standard factory setting. Even if air lines are connected wrongly by mistake, the SS2 positioner detects automatically and performs auto-calibration for direct acting (DA).

② If the actuator doesn't work with 4-20mA input signal properly, change air lines of OUT1 and OUT2 with each other and perform auto-calibration again.

③ For a reverse acting type (RA), a countdown will begin like RA-5-4-3-2-1-END. For a direct acting type (DA), a countdown will begin like 5-RA-DA-4-3-2-1-END.

11.4.5.B. Initializing Setting Values (RESET)

All setting values return to the standard factory setting values.



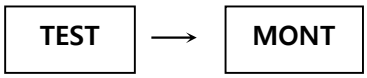
11.4.5.C. Re-adjustment of Zero & Span (STEN)

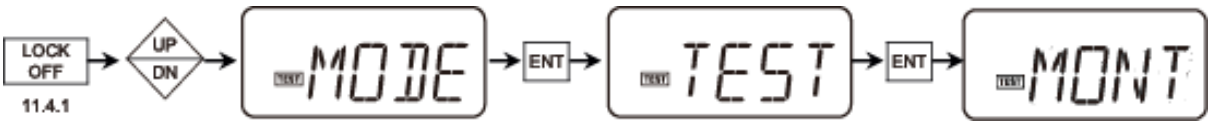
Only Zero and Span is re-set without changing other values set after auto-calibration.

11.4.5.D. COLD (Re-booting)

Restarts the program without changing any settings

11.4.6. Self-Test Mode

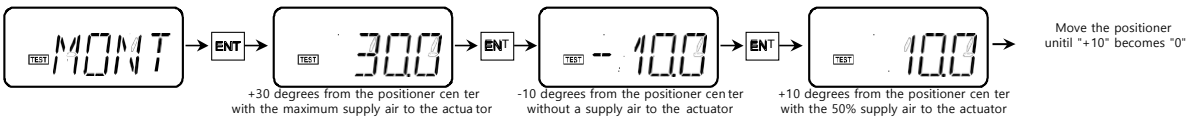






• The current valve mounting situation is shown. If the value is far away from 0, the valve will suffer from a poor linearity and hysteresis. Move the positioner and try to reach closer to 0 for the best linearity and hysteresis.

- How to set MONT



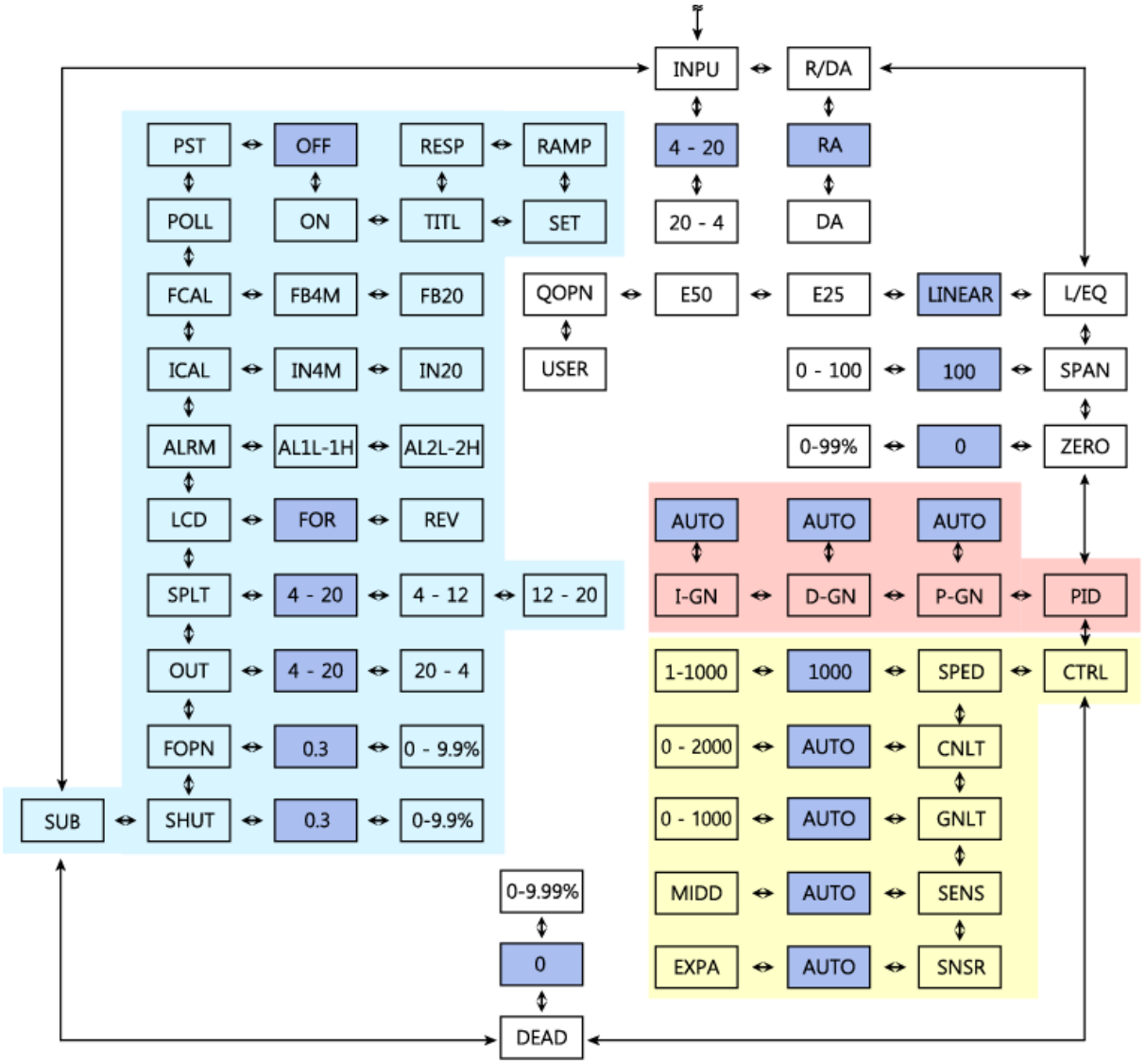
For information, on "MONT", the operating range (0~10kΩ) of the potentiometer is displayed.

- Step 1: Select MONT and push the ENT button one time, and the valve will be fully open or closed and also the actual valve position angle will be shown.

- Step 2: Push the ENT button one time, and the valve will be fully open or closed and also the actual valve position angle will be shown.

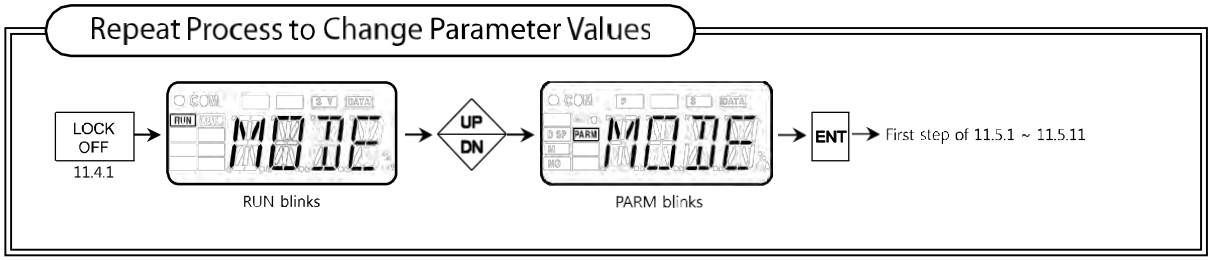
- Step 3: Push the ENT button one time, and the actual valve middle position angle will be shown. It shows the middle position angle between two ends (fully open and closed) measured through the above procedures of Step 1 and Step 2. Move the positioner upwards or downwards so that the valve position angle can reach closer to 0. And fix the mounting bracket tightly.

11.5. Parameters Flow Diagram



The colored cells stand for the standard factory settings.

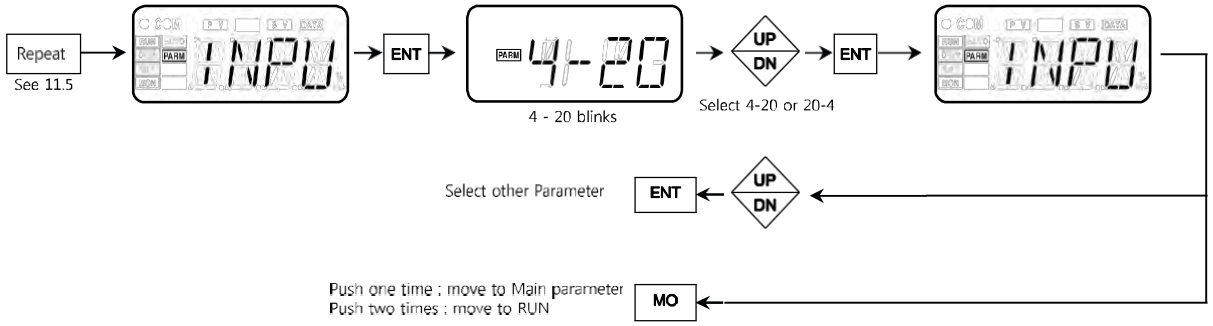
All setting values return to the standard factory settings if RESET begins.



11.5.1. [INPU] Change of Input signal (default: 4-20mA)

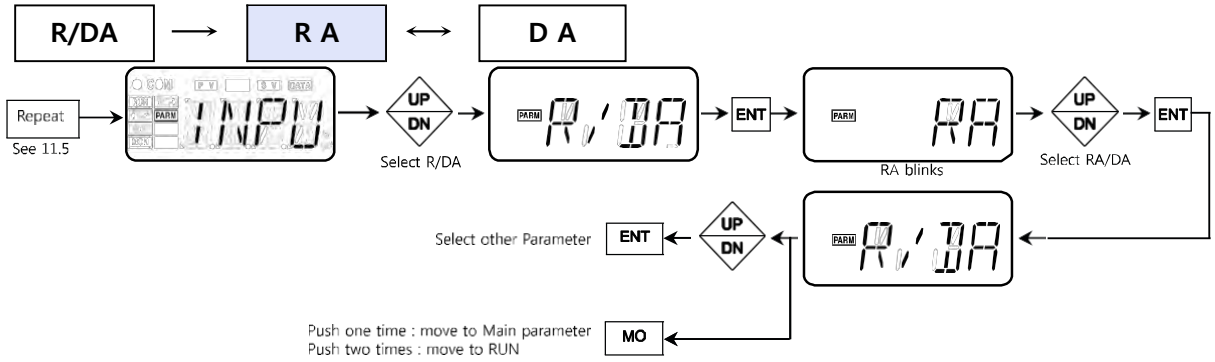
INPU ⟶ **4-20** ⟷ **20-4**

It is possible to make the positioner respond to 20-4mA input signals optionally even though 4-20mA input signals are supplied.



11.5.2. [R/DA] Selection of Direct Acting (DA) or Reverse Acting (RA) (default: RA)

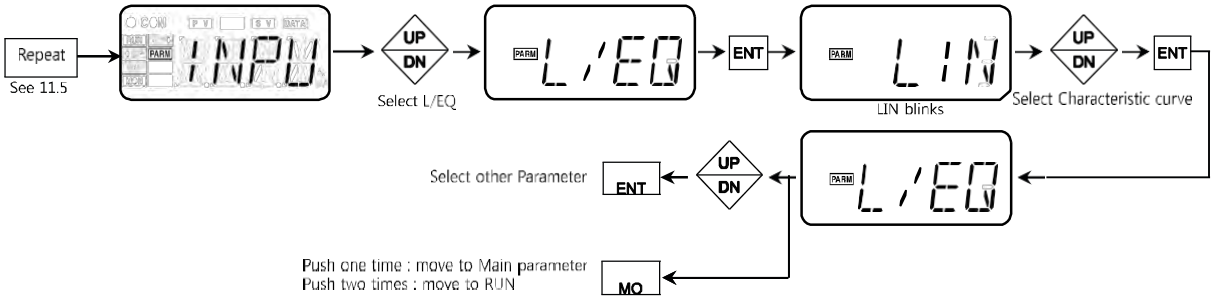
R/DA ⟶ **R A** ⟷ **D A**

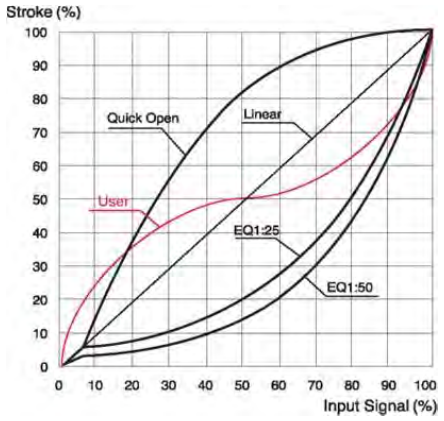


11.5.3. [L/EQ] Selection of Linear, E.Q.%, Quick Open or User Set (default: Linear)

L/EQ ⟶ **LIN** ⟷ **E25** ⟷ **E50** ⟷ **QOPN** ⟷ **USER**

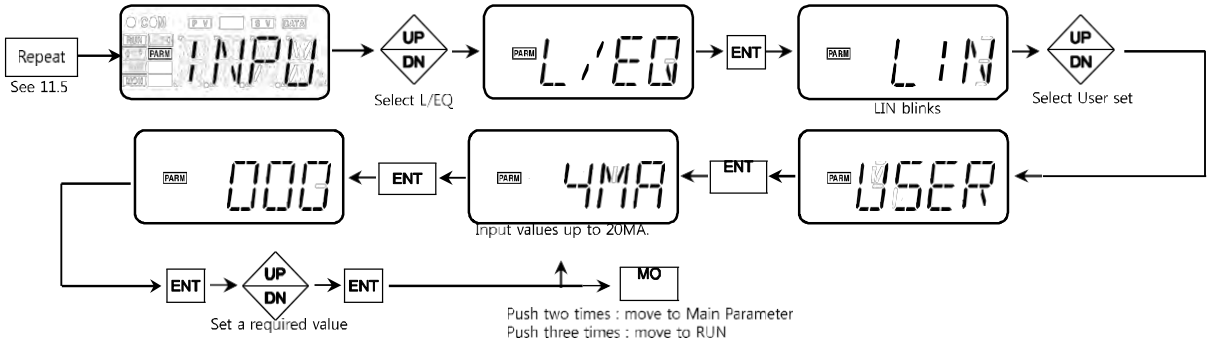
The valve characteristic can be changed to Linear, 1:25 EQ%, 1:50 EQ%, Quick Open or User Set.



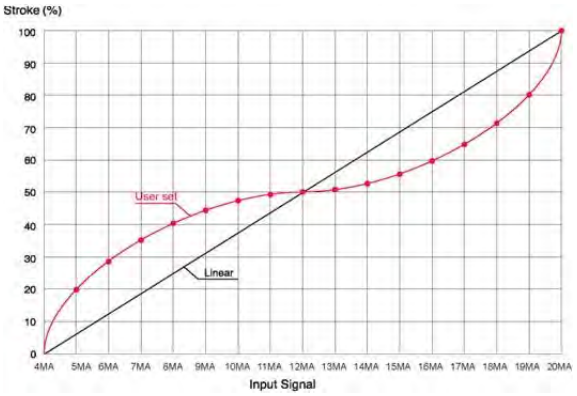


LIN	Linear
EQ25	EQ% (1 / 25)
EQ50	EQ% (1 / 50)
QOPN	Quick Open
USER	User set(17point)

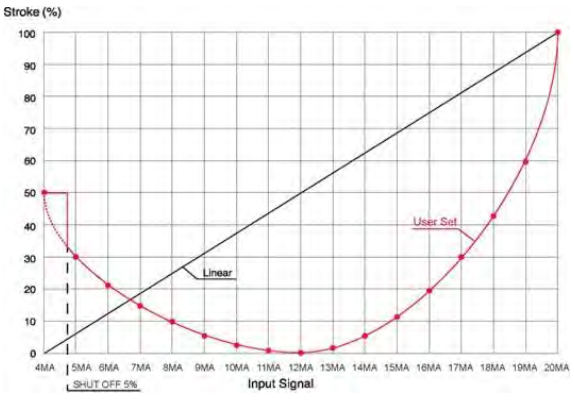
- For the user setting,



Example 1)



Example 2)



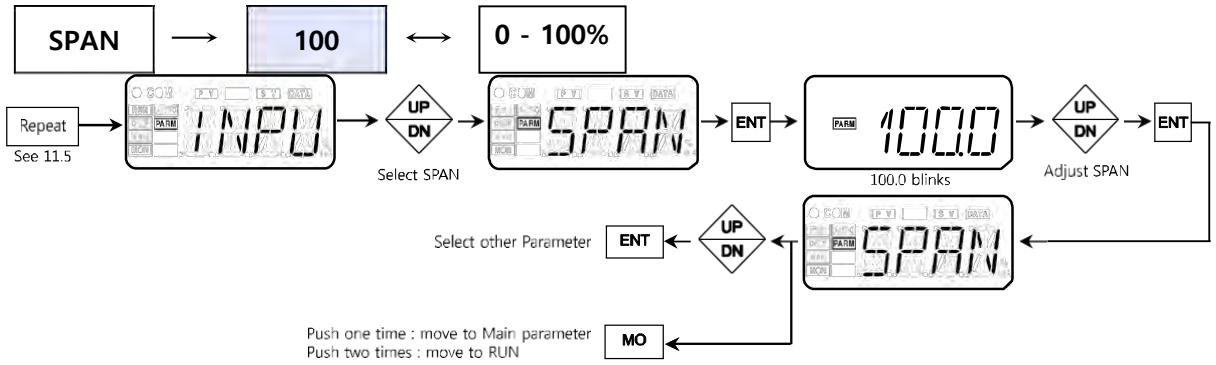
User Set Value			Ex-1	Ex-2
Point	Parameter	Input Signal (mA)	Valve Opening% (set value)	
1	4MA	4mA	0	50
2	5MA	5mA	20	30
3	6MA	6mA	29	20
4	7MA	7mA	35	15
5	8MA	8mA	40	10
6	9MA	9mA	45	6
7	10MA	10mA	48	4
8	11MA	11mA	49	2
9	12MA	12mA	50	0
10	13MA	13mA	51	3
11	14MA	14mA	52	7
12	15MA	15mA	55	11
13	16MA	16mA	60	20
14	17MA	17mA	65	30
15	18MA	18mA	71	43
16	19MA	19mA	80	60
17	20MA	20mA	100	100

NOTES

1. This user setting has a linear characteristic as standard.
2. 5MA means % corresponding to 5mA.
3. Input all 4MA to 20MA for a required user set characteristic curve.

※ If Shut Off option is set, the set value at 4mA is maintained during interval of the Shut Off setting value as shown in Example 2). The curve goes according the user set value after interval of the Shut Off setting value. (0.3% is the default value of Shut Off.) As Shut-Off is set to 5% in Example 2), the curve maintains by 50% from 4 to 4.8mA and moves forward according to the user set.

11.5.4. [SPAN] Span Adjustment (default: 100)

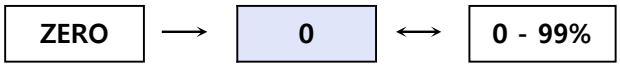


① Be sure to supply 20mA input signal before adjusting SPAN.

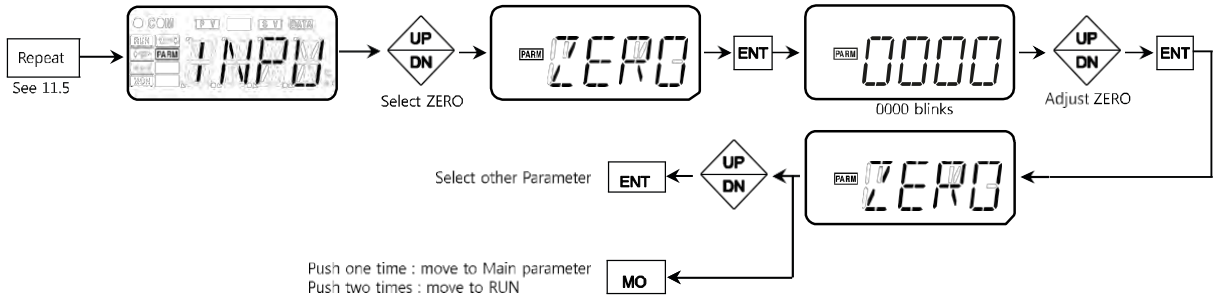
② Push ▼ DN button one time, Span will decrease by 0.1%. Keep pushing ▼ DN button, Span will decrease fast.

③ For a quick Span setting, push ▼ DN button for 5 seconds. (see 10.2)

11.5.5. [ZERO] Zero Adjustment (default: 0)

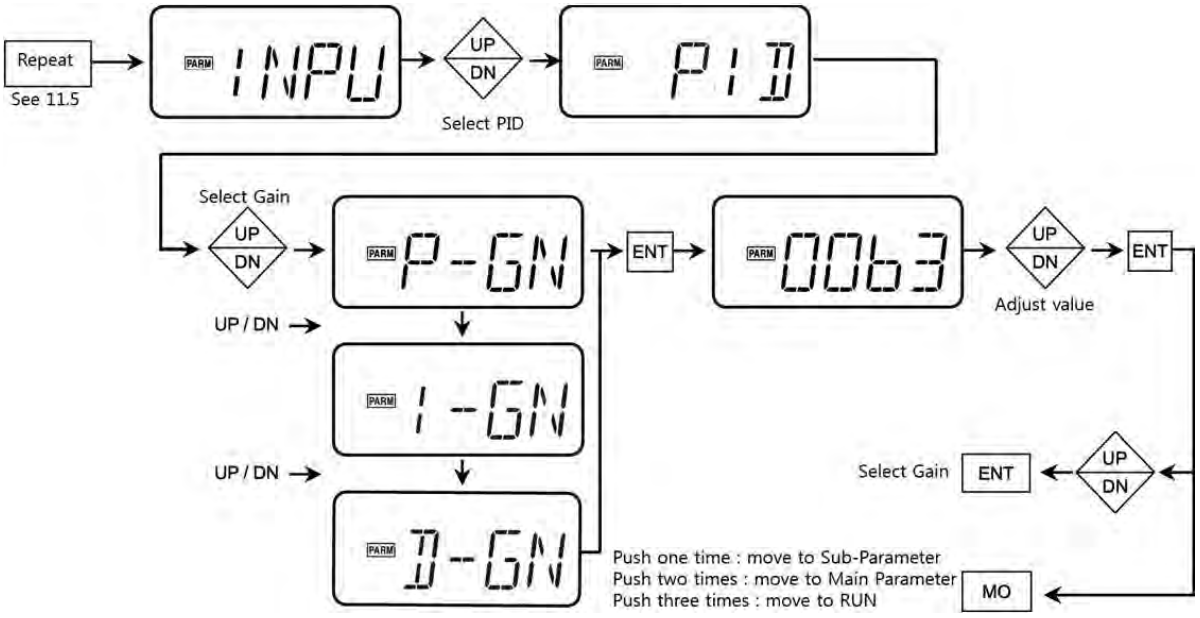


Zero can be adjusted to 0 – 99%.



11.5.6. PID-Gain

PID ⟶ **P-GN** ⟷ **I-GN** ⟷ **D-GN**



11.5.6.A. P-Gain (Proportional Gain)

P-GN ⟶ **Auto Set**

The micro-processor calculates P-Gain value during auto-calibration process in consideration of sizes of the valve and the actuator. If a hunting problem happens, decrease P-Gain value. If an oscillation problem happens, increase P-Gain value. P-Gain values are different according to the working conditions. In case of a small actuator, increase or decrease 5 to 10. In case of a big actuator, increase or decrease by 20 to 30.

11.5.6.B. I-Gain (Integral Gain)

I-GN ⟶ **Auto Set**

As I-Gain is set automatically during auto-calibration process, it is not necessary to change manually.

11.5.6.C. D-Gain (Differential Gain)

D-GN ⟶ **Auto Set**

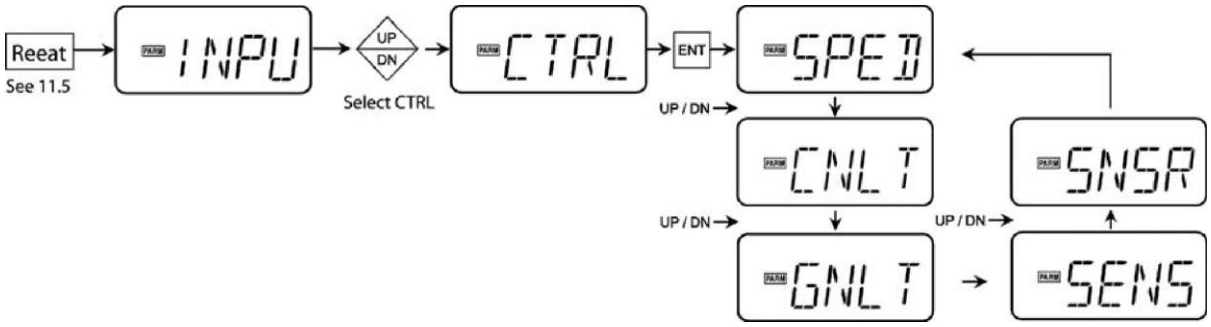
As D-Gain is set automatically during auto-calibration process, it is not necessary to change manually.

① Push MO button one time in order to move to ten figures or hundred figures.

② For a quick P-Gain setting, push UP button for 5 seconds. (see 10.3)

11.5.7. [CTRL] – Control Speed Adjustment

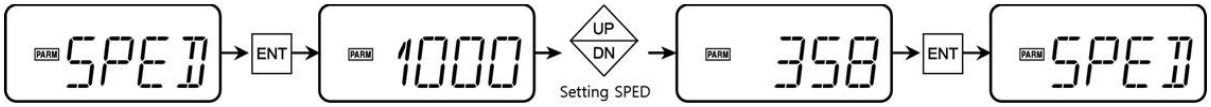
CTRL → **SPED** ↔ **CNLT** ↔ **GNLT** ↔ **SENS** ↔ **SNSR**



11.5.7.A. [SPED] – Response Speed Adjustment (default: 1000)

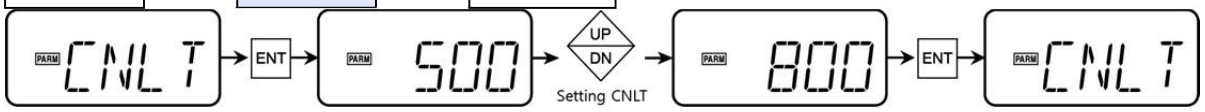
SPED → **1...1000**

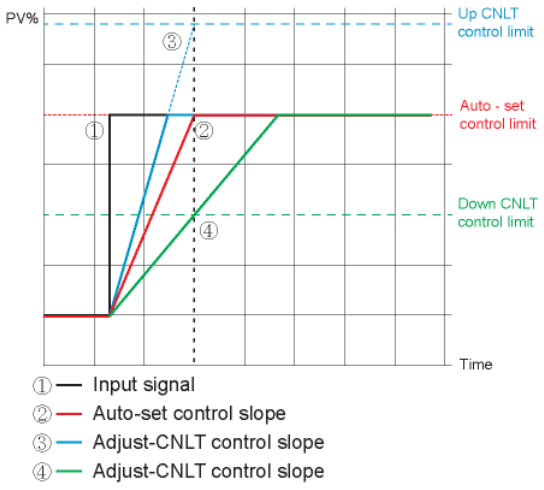
This is to adjust the response speed of the actuator. (Min: 1, Max: 1000)



11.5.7.B. [CNLT] – Control Limit (default: automatically-set)

CNLT → **AUTO** ↔ **50-1250**





CNLT is to limit a control range and set automatically during an auto-calibration process. When 0% - 100% input signal is supplied, a recognition range of the positioner is settled according to CNLT.

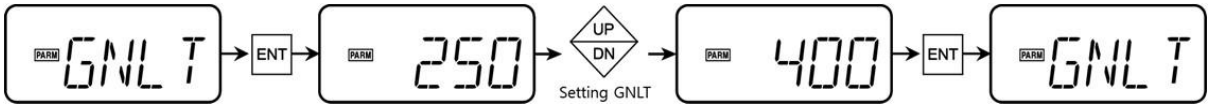
If CNLT is increased as shown in Graph 3, a control speed can become faster but a hunting problem can happen. If CNLT is decreased as shown in Graph 4, a control speed can become slower but the positioner works more stably.

CNTL can be adjusted by 100.

11.5.7.C. [GNLT] – Gap Control Limit (default: automatically-set)

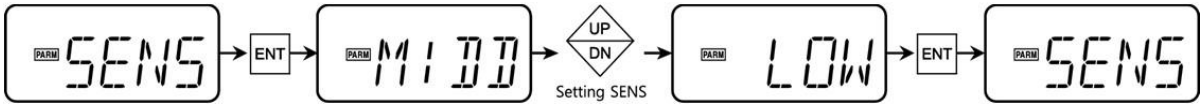
GNLT ⟶ **AUTO** ⟷ **100-650**

GNLT is to control a whole operating range. If the valve comes within ±3% of input signal, GNLT works with 1/2 value of CNLT for a safer control. In case that a hunting or oscillation problem happens around the position related to the input signal, a safer control can be accomplished by lowering GNLT.



11.5.7.D. [SENS] – Setting of Sensitivity (default: MIDD)

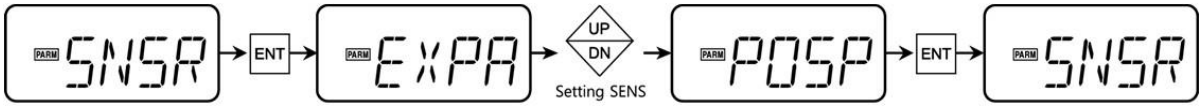
SENS ⟶ **MIDD** ⟷ **LOW** ⟷ **HIGH**



This is to set a sensitivity of positioner. For a more stable control, set to HIGH with a big actuator and to LOW with a small actuator.

11.5.7.E. [SNSR] – Setting of Sensor (default: EXPR)

SNSR ⟶ **EXPA** ⟷ **POSP** ⟷ **VALP** ⟷ **NONE**



This is to change the setting of linear type feedback lever connection to the valve.

	Default		In case that the feedback pin guide lever is connected to the positioner feedback lever
	No setting change		In case that the valve stem pin is connected to the positioner feedback lever

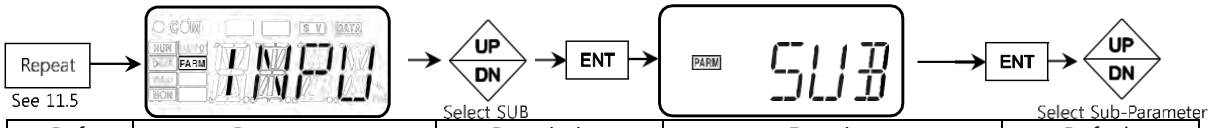
11.5.8. [DEAD] Setting of Dead Band (default: 0.3)

DEAD ⟶ **0.3** ⟷ **0-9.99%**

If there is a difference between Setting Value(SV) and Present Value(PV), adjust Dead Band to 0 - 9.99%.

0.3% is a standard factory setting. For reference, 0.30 corresponds to 0.3% and the maximum value is 9.99 % (9.99).

11.5.9. SUB Parameter

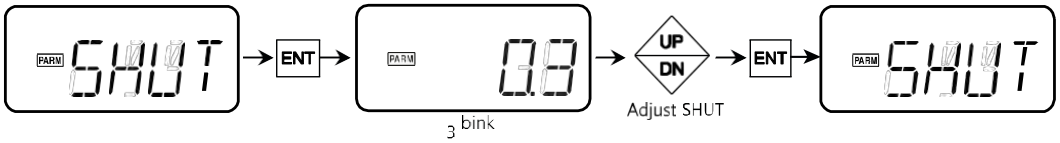


Ref.	Parameter	Description	Function	Default
11.5.9.A	SHUT	Shut-off	0...9.9%	0.3%
11.5.9.B	FOPN	Full-open	0...9.9%	0.3%
11.5.9.C	OUT	Output signal	4...20mA or 20...4mA	4...20mA
11.5.9.D	SPLT	Split range	4...12mA or 12...20mA	4...20mA
11.5.9.E	LCD	Change of display position on LCD	Forward or reverse direction	FOR
11.5.9.F	ALRM	Softwarelimit low, high	AL1L/AL1H, AL2L/AL2H	0...10%, 90...105%
11.5.9.G	ICAL	IN4M / IN20	sets to values relating to 4-20mA input signal	Factory setting
11.5.9.H	FCAL	FB4M / FB20	sets to values relating to 4-20mA output signal	Factory setting
11.5.9.I	POLL	HART polling address	0...15	0
11.5.9.J	PST	Partial stroke testing	checks a valve status	OFF
11.5.9.K	ADDR	PROFIBUS Address	PROFIBUS Address 변경	126

11.5.9.A. [SHUT] Valve Shut-off Control (default: 0.3)

SHUT ⟶ **0.3** ⟷ **0-9.9**

It is a safety function to close a valve completely. And it is possible to change 0% to 9.9%. For reference, 0.1% means that the positioner responds to 0.016mA. Therefore, the standard value of 0.3% means that a valve is closed at 4.048mA completely.



11.5.9.B. [FOPN] Valve Full Open Control (default: 0.3)

FOPN ⟶ **0.3** ⟷ **0-9.9**

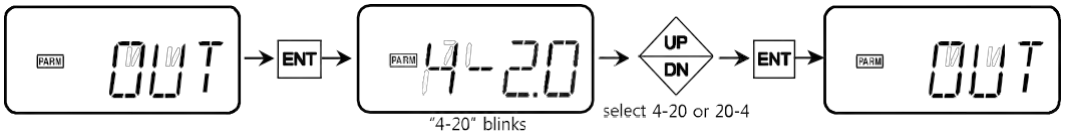
The valve can be fully open manually. And it is possible to change 0% to 9.9%. For reference, 0.1% means that the positioner responds to 0.016mA. Therefore, the standard value of 0.3% means that a valve is fully open at 19.952mA.



11.5.9.C. [OUT] Setting of Output Signal (default: 4 - 20mA)

OUT ⟶ **4 - 20** ⟷ **20 - 4**

4 – 20mA is a standard factory setting. It's available to change to 20 – 4mA reversely.



11.5.9.D. [SPLT] Split Range Setting (default: 4-20)

SPLT ⟶ **4-20** ⟷ **4-12** ⟷ **12-20**

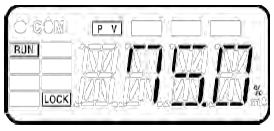
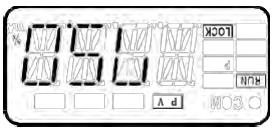
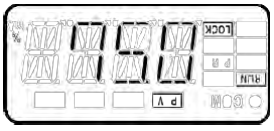
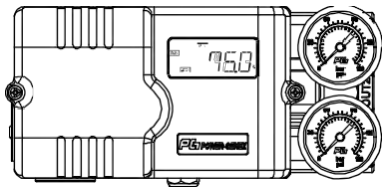
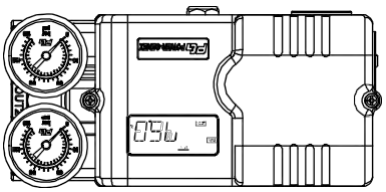
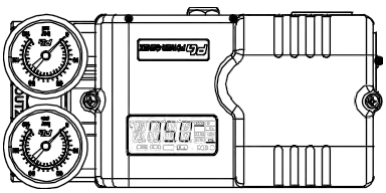
Split range can be set to 4-12mA or 12-20mA.



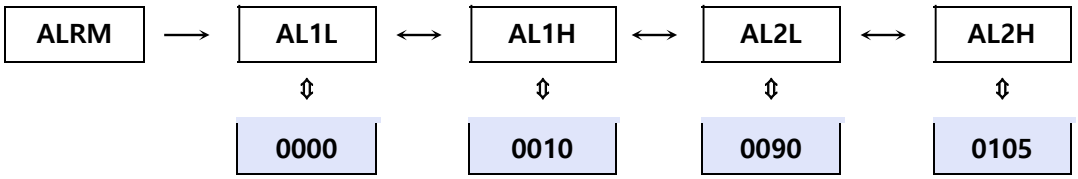
11.5.9.E. [LCD] Change of Display Position on LCD

LCD ⟶ FOR ⟷ **REV**

LCD is to change the display position on LCD in case that the positioner is installed upside down.

		
LCD : FOR	LCD : FOR	LCD : REV
		

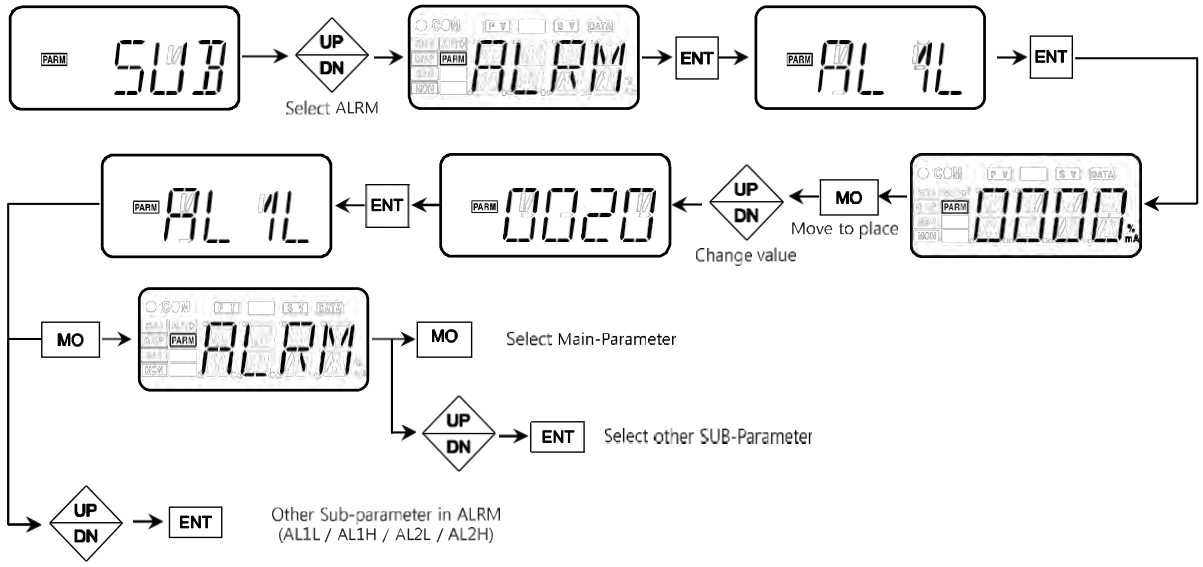
11.5.9.F.[ALRM] Setting of 24VDC Software Limit Switches (default: 0 – 10%, 90 – 105%)



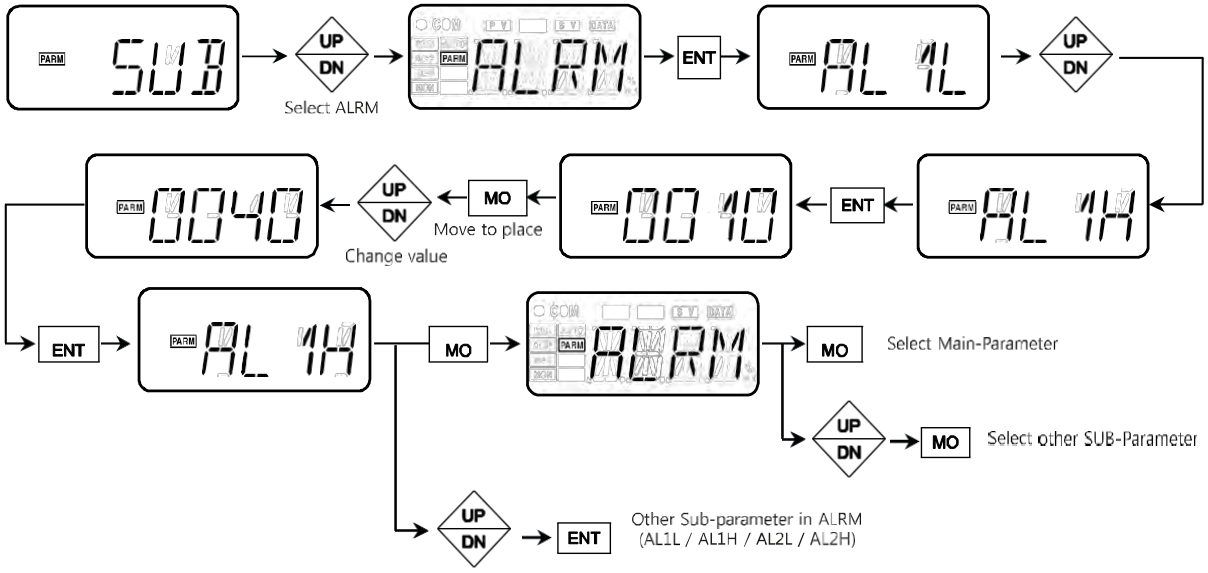
You can set an opening point or a closing point of a control valve. AL1 (L, H) is set to 0 – 10% and AL2 (L, H) is set to 90 – 105% from the factory as standard.

For example, see the below in order to re-set AL1 to 20 – 40% (AL1L = 20, AL1H = 40).

① AL1L Setting

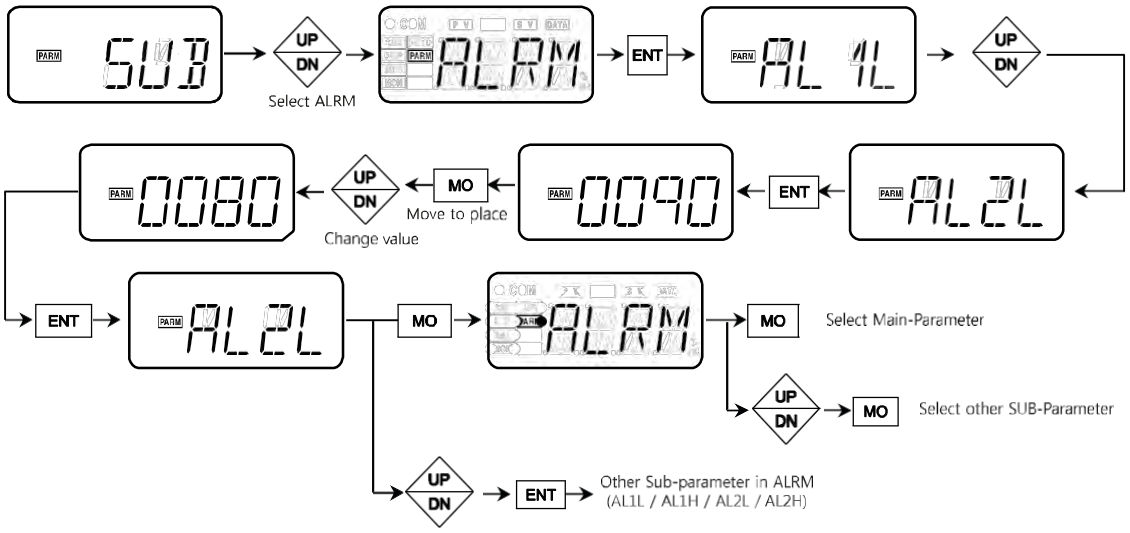


② AL1H Setting

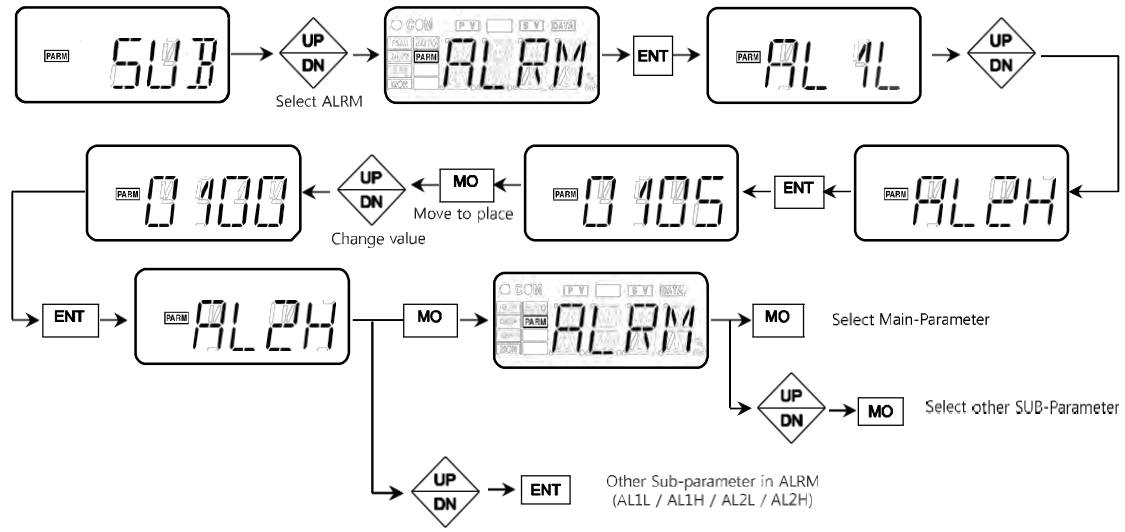


For example, see the below in order to re-set AL2 to 80 – 100%(AL2L = 80, AL2H = 100).

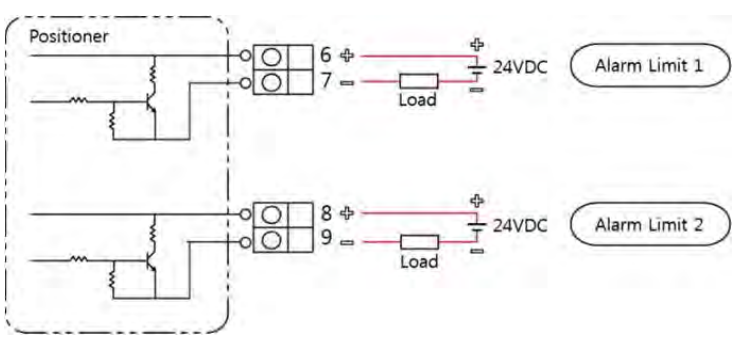
① AL2L Setting

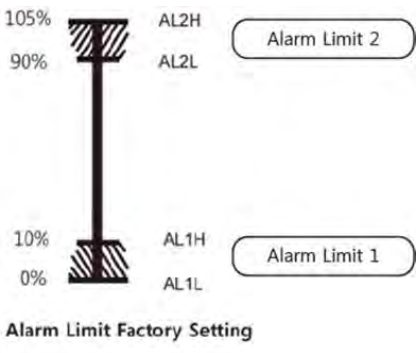


② AL2H Setting



How to wire 24VDC software limit switches





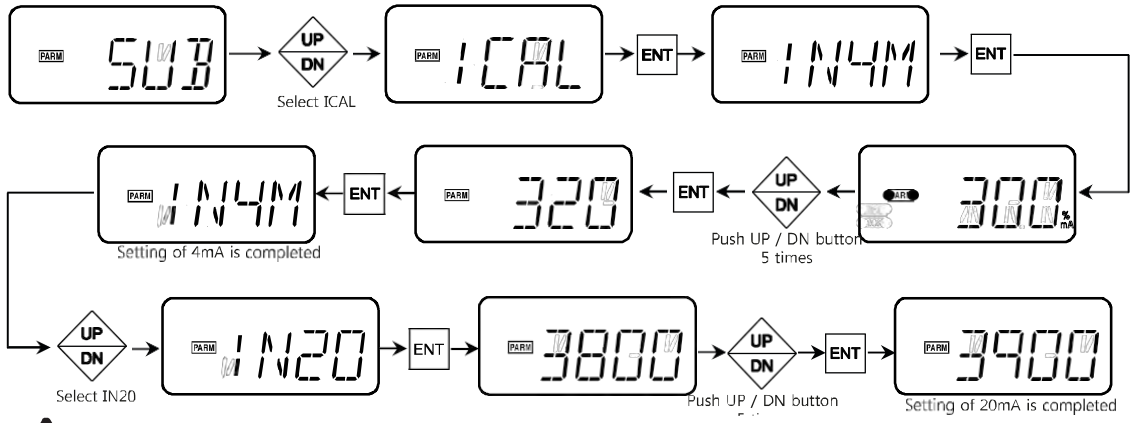
24VDC should be supplied for software limit switches.

11.5.9.G. [ICAL] – Setting of Input Signal (default: factory setting)

ICAL ⟶ **IN4M** ⟷ **IN20**

This is to match 4mA and 20mA input signals from a signal calibrator with the internal setting 0% and 100% of the positioner and save onto memory.

If 4mA output signal is measured as 4.2mA and 20mA output signal as 19.8mA with a signal calibrator on site, 4.2mA can be recognized as 0% and 19.8mA as 100% by re-setting with ICAL.



If ICAL is set at 4mA and 20mA, the middle output signals between 4mA and 20mA are set automatically. See [11.5.3 L/EQ] if it is necessary to change other characteristic curve.

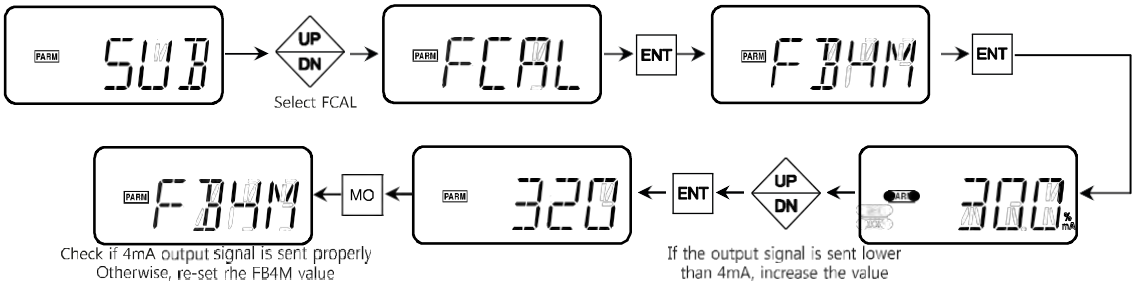
11.5.9.H. [FCAL] – Setting of Output Signal (default: factory setting)

FCAL ⟶ **FB4M** ⟷ **FB20**

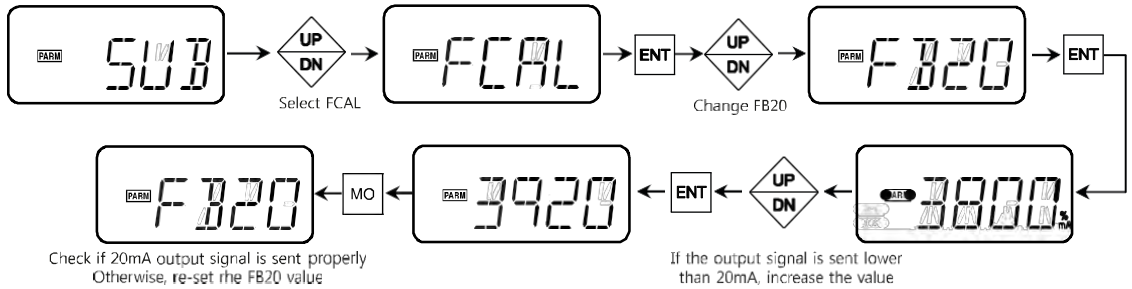
This is to re-set the 4 – 20mA output signals coming from the positioner.

The factory setting is that 4mA is sent at 0% and 20mA is sent at 100%.

<Setting of FB4M>



<Setting of FB20>



11.5.9.I. [POLL] – HART Communication Polling Address (default: 0)

POLL ⟶ **0** ⟷ **0 ~ 15**

This is to select one of HART communication polling address (0 ~ 15) on site. The default address is "0".

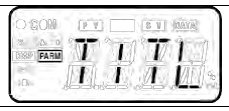
As an unexpected problem can happens during communication, try to select after disconnecting HART communication.

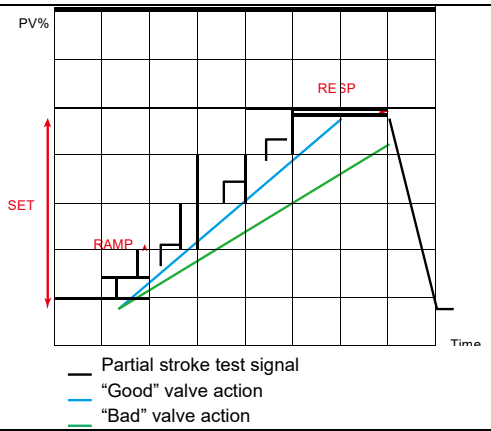
11.5.9.J. [PST] – Partial Stroke Testing (default: OFF)

Note that the PST function (Partial Stroke Testing) is loaded at the factory on demand only when requested.

PST ⟶ **ON** / **OFF** ⟷ **TITL** ⟷ **SET** ⟷ **RAMP** ⟷ **RESP**

This is to move the valve periodically regardless of input signals and check the valve status.

	- to set the TEST time interval (default: '0024' – 24 hours) - Setting of '0000' shows the PST working status every 1 minute.
	- to set the moving point by % during TEST (default: 10%) - Valve position > 50% : move to the deceasing direction - Valve position < 50% : move to the increasing direction
	- to adjust a moving range per second (default: 1.0%/sec) - One of 1.0, 0.5, 0.25, 0.12, or 0.06%/sec can be selected.
	- to adjust a waiting time that the valve follows after the test signal (default: '10' seconds)
Even though 'Good' is shown, if RESP is set too long, the judgment point will not be good for the next comparison. Also, if 'Bad' is shown, RESP is set too low. Adjust RESP.	
	to show that there is no problem if the valve reaches Dead zone of the set position.
	to show that it is necessary to check the valve status if the valve fails to reach Dead zone of the set position.



- It is possible to prevent the valve from getting stuck in the long term.
- Do not activate the PST function if it is not intended to use.
- The PST function is deactivated after auto-calibration.

11.5.9.K. [ADDR] - PROFIBUS Communication Address (default: 126)

ADDR	⟶	0	⟷	0 ~ 126

This is to select one of PROFIBUS communication address (0 ~ 125) on site. The default address is "126".

12. Maintenance / Service

12.1. Preliminary Check Points

12.1.1. Voltage

- The positioner commonly requires 4-20mA @ 24VDC for operation.
- Voltage drop (impedance): Without HART – 8.7VDC (435Ω @ 20mA)
  With HART – 9.4VDC (470Ω @ 20mA)

12.1.2. Electrical Connections

Check polarities (+, -) of 4-20mA input signal definitely and make the electrical connections.

12.1.3. Pneumatic Connections (see 8.1, 8.2)

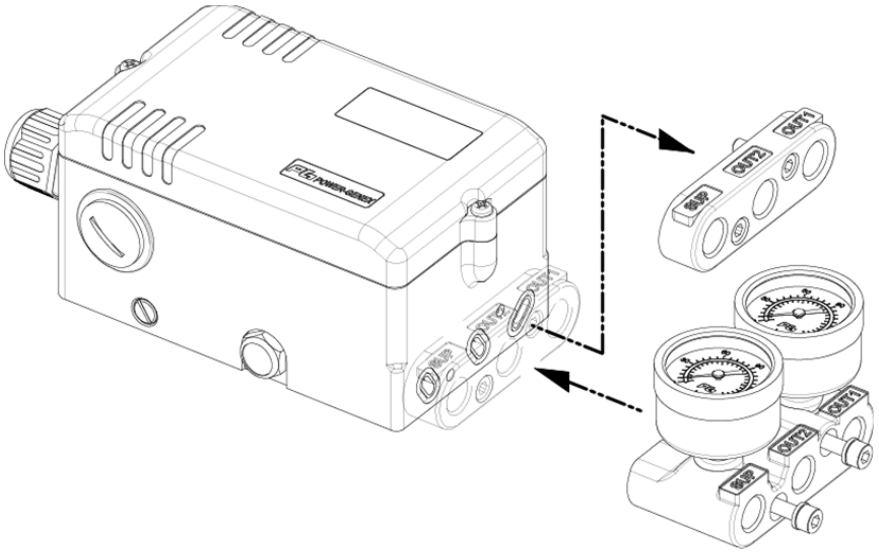
12.1.4. Supply Air Quality

A supply air should be definitely clean and compressed free of water, moisture or oil in conformance with IEC 770 and ISA-7.0.01.

12.2. Module Parts

① RTQ Coil Assembly (spare part No. 12)
② Pilot Valve Assembly (spare part No. 5)
③ PCB Control Board Assembly (spare part No. 3)

12.3. Structure of Gauge Block



12.4. Re-setting of Potentiometer (spare part No. 14a, 14b)

It is necessary to adjust a setting of potentiometer as below when a gear position is moved due to user's carelessness. For reference, 0~10kΩ potentiometer is installed into the SS2 positioner.

① Dis-install the electronic card from the SS2 positioner and make the markings on two gears match with each other.

② Move the feedback lever to 50% position and adjust a potentiometer so that it can reach nearly 5kΩ.

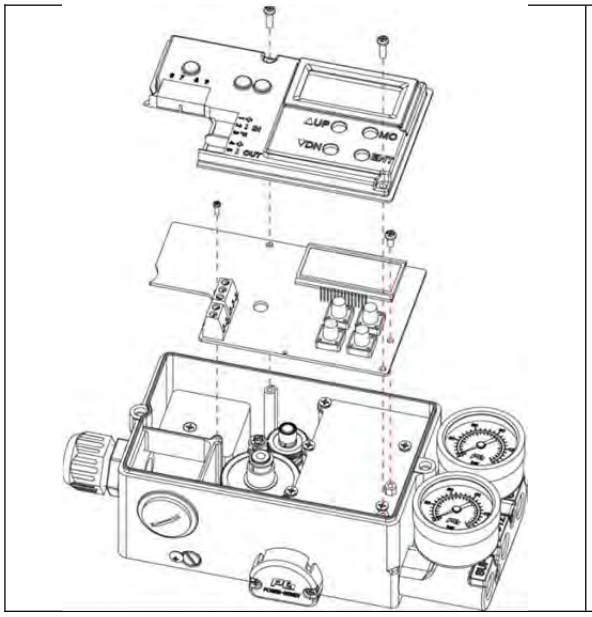
③ Re-install the SS2 positioner onto the valve and re-perform auto-calibration.

12.5. EXCHANGING POSITIONER SPARE PARTS

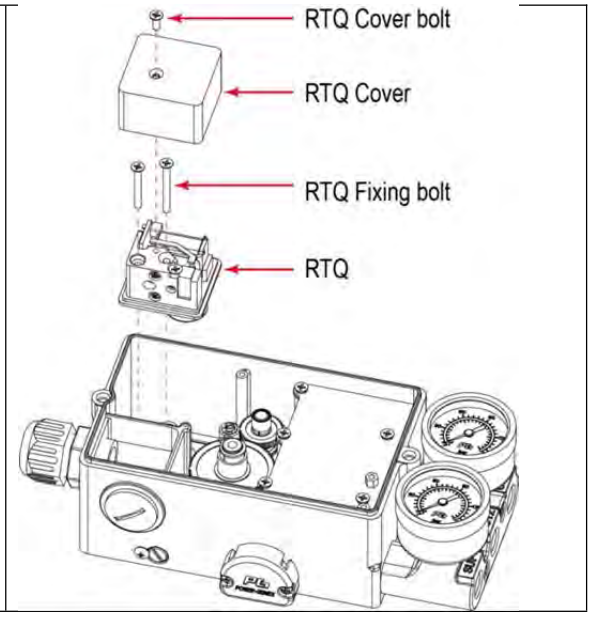
① BEGIN PROCEDURE AFTER COMPLETE REMOVAL OF SUPPLY AIR

② PLEASE RE-START AUTO-CALIBRATION PROCEDURE AFTER EXCHANGIN SPARE PART

12.5.1. HOW TO EXCHANGE SS2L / SS2R'S RTQ COIL



<Fig.1 COVER / BOARD ASS'Y/DISASSEMBLE >



<Fig. 2 RTQ ASS'Y/DISASSEMBLE >

① Disassemble the Positioner cover.

② Disassemble the Bolts (2EA) Holding PCB-board cover (Diagram 1)

③ Disassemble the Bolts (2EA) Holding PCB-board (Diagram 1)

④ Disassemble the Bolts (2EA) Fastened on Positioner and Disassemble 2 Connectors (2PIN, 3PIN) connecting the positioner and PCB-Board

⑤ Disassemble Bolt(1EA) (Diagram 2) After removing the Seal on RTQ Cover Bolt

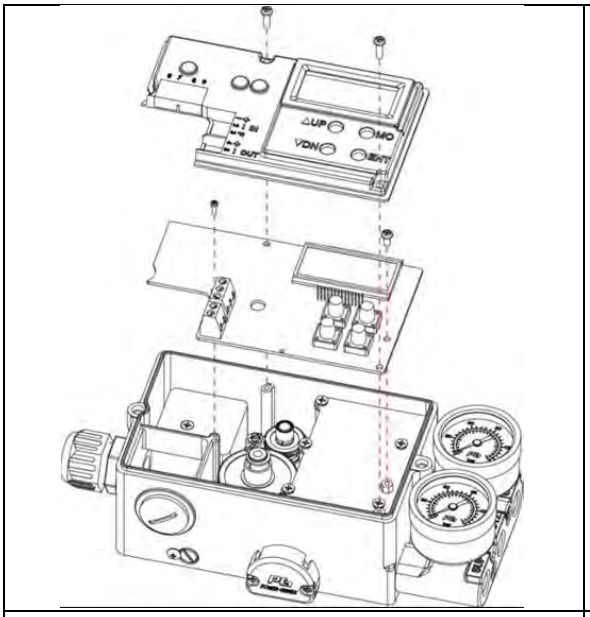
⑥ Disassemble Fixing Bolts, (2EA) (Diagram 2) after Removing RTQ cover.

⑦ Disassemble RTQ (Diagram 2)

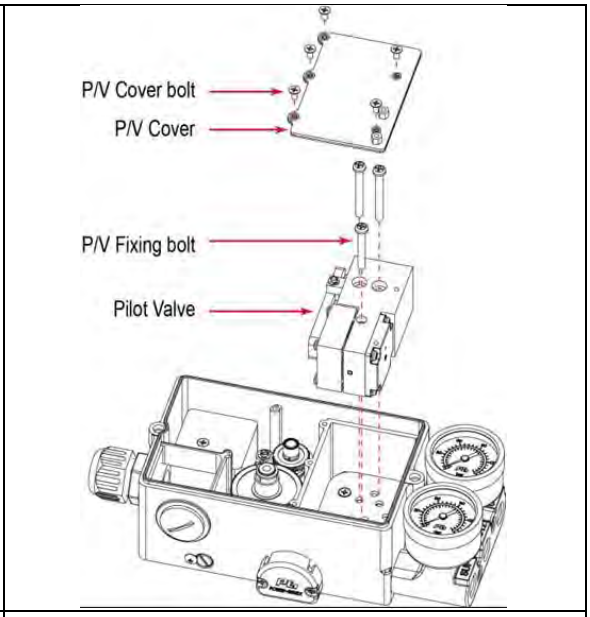
⑧ Re-assemble using New RTQ by following above steps reversely.

⑨ Re-Start Auto-Calibration after completing Assembly

12.5.2. HOW TO EXCHANGE SS2L / SS2R'S PILOT VALVE



<Fig. 3 COVER / BOARD ASS'Y/DISASSEMBLE >



<Fig. 4 PILOT VALVE ASS'Y/DISASSEMBLE >

① Disassemble the Positioner cover.

② Disassemble the Bolts (2EA) Holding PCB-board cover (Fig. 3)

③ Disassemble the Bolts (2EA) Holding PCB-board (Fig. 3)

④ Disassemble the Bolts (2EA) Fastened on Positioner and Disassemble 2 Connectors (2PIN, 3PIN) connecting the positioner and PCB-Board

⑤ Disassemble P/V cover bolts(6EA) (Fig. 4)

⑥ Disassemble Fixing Bolts(3EA), after Removing P/V cover. (Fig 4)

⑦ Disassemble Pilot Valve (Fig. 3)

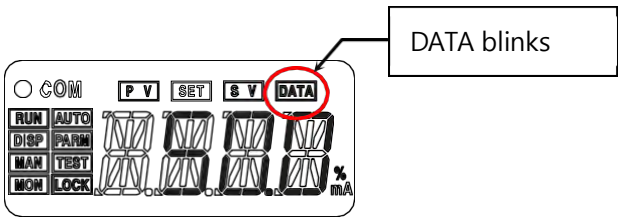
⑧ Re-assemble using New Pilot Valve by following above steps reversely.

⑨ Re-Start Auto-Calibration after completing Assembly

13. Troubleshooting

13.1. Error Codes and Recommended Actions

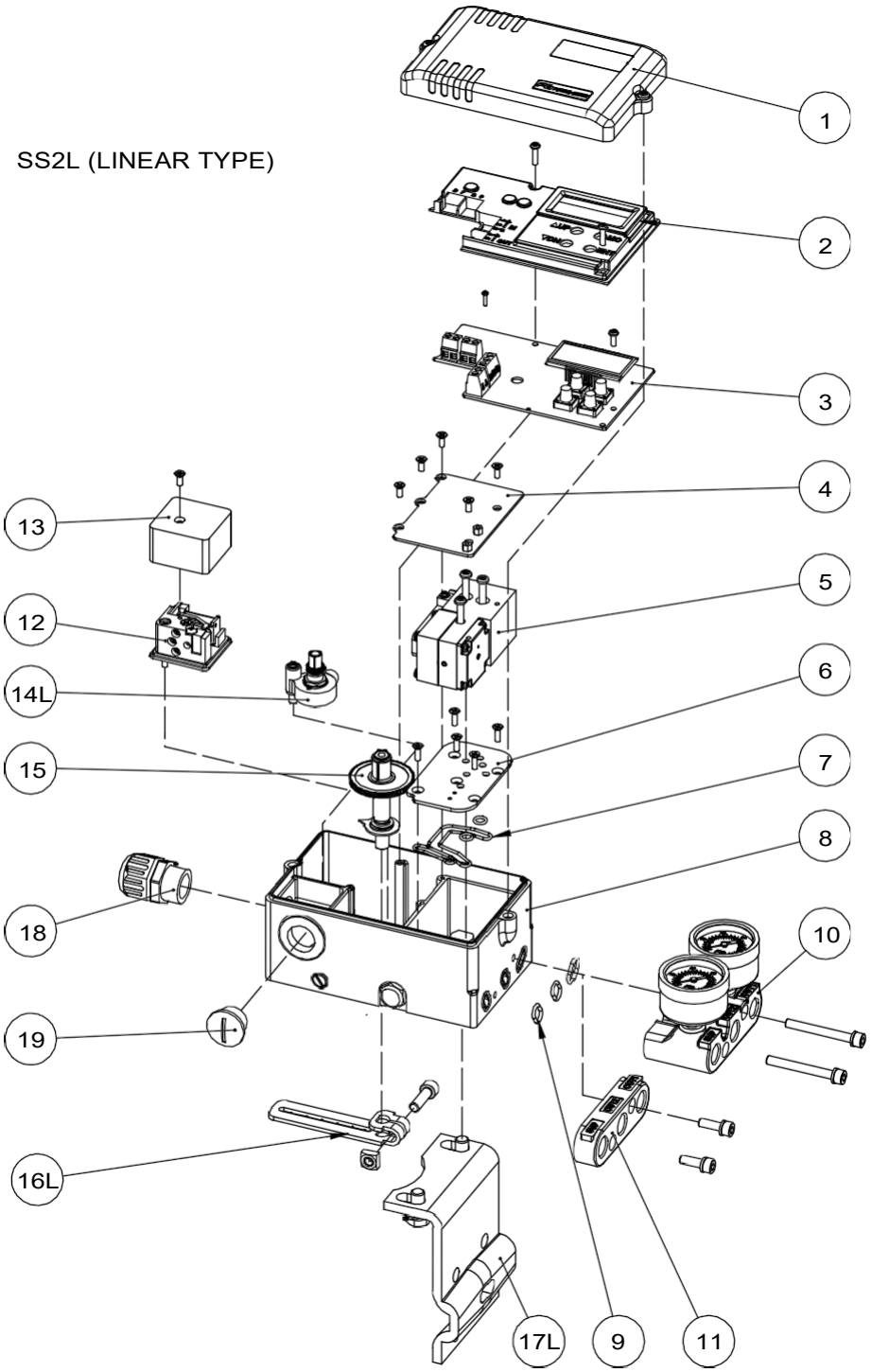
If the positioner doesn't work properly and DATA on LCD blinks, try to take action as below.



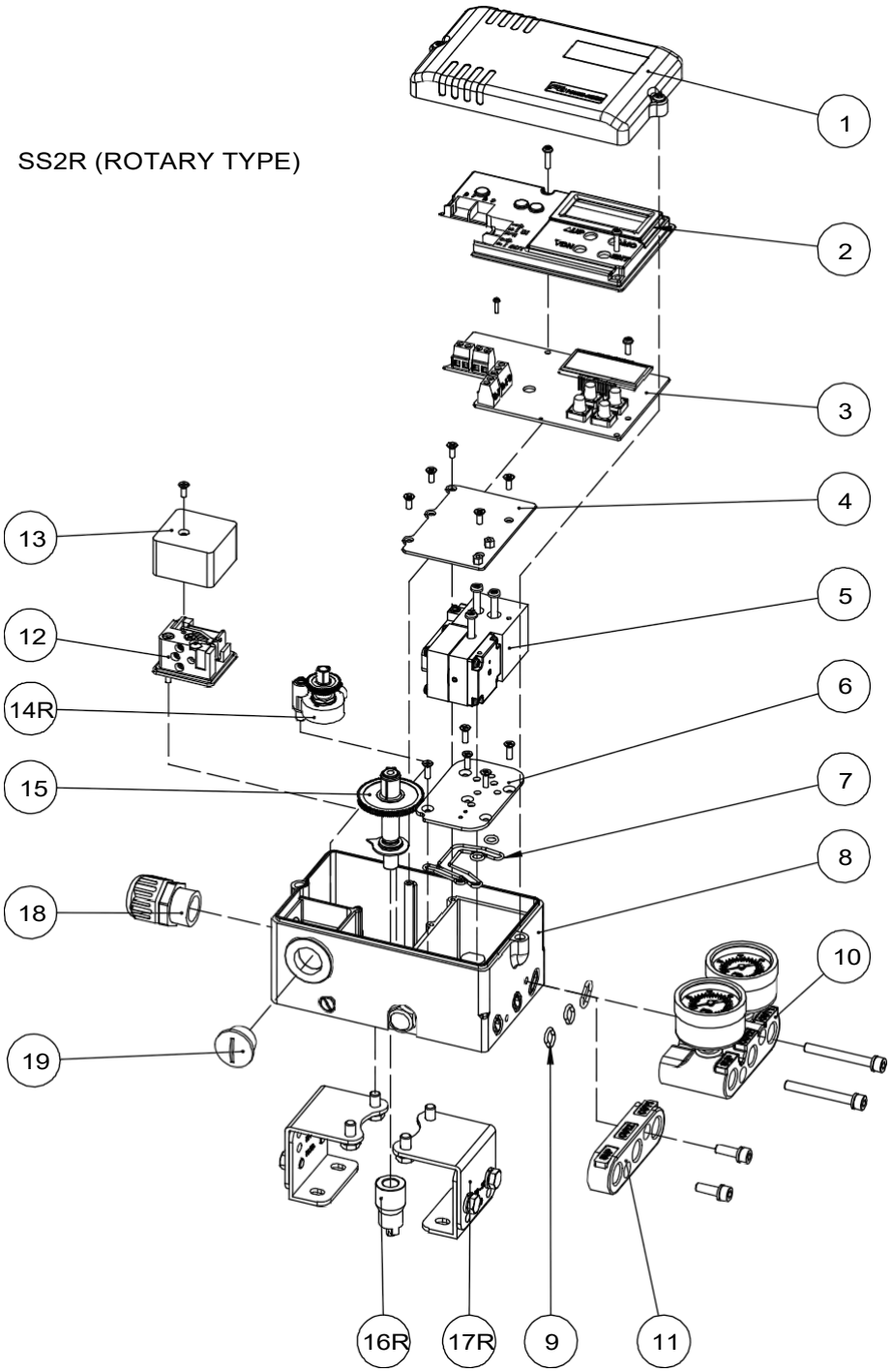
Error Code	Cause	Symton	Action
CMLO	Low input current (3.7mA)	Data on LCD are shown too dim or too bright.	Re-check 4 – 20mA input signals.
CMHI	High input current (20.5mA)		
IGMI	Down Speed Long	Slow operation	The actuator is too big. Use the air volume booster.
IGMX	Up Speed Long		
H/RX	HART Rx Error	HART signal failure	Re-set and re-connect will be done after 2.5 seconds, but it is necessary to check the communication system in case of a continuous error.
MONT	Operating angle out of range	MONT is shown during step 4 and an auto-calibration process is finished without completion.	Re-install the SS2L / SS2R positioner.
LOTT	Bias Low	The valve is not closed or moves slowly.	Loosen a valve packing.
HITT	Bias High	The valve is not open or moves slowly.	
FBFT	Feedback error (0 - 1%)	PM00 is shown at step 4 and an auto-calibration is finished without completion.	Defectiveness of potentiometer socket contact or PCB board
FBSM	Feedback error (2 - 9%)	The operating stroke is too small and the valve doesn't work smoothly.	Re-install the potentiometer and increase the operating angle of the feedback lever.
BAD	PST error	BAD is shown.	Check the valve or increase the response time of PST.
PONT	Potentiometer Error	Problem of potentiometer	Check the potentiometer (Potentiometer Ass'y, Board)
RTQ	Coil Error	Problem of coil	Check the coil assembly.

14. Spare Parts

14.1. SS2L Spare Parts



14.2. SS2R Spare Parts

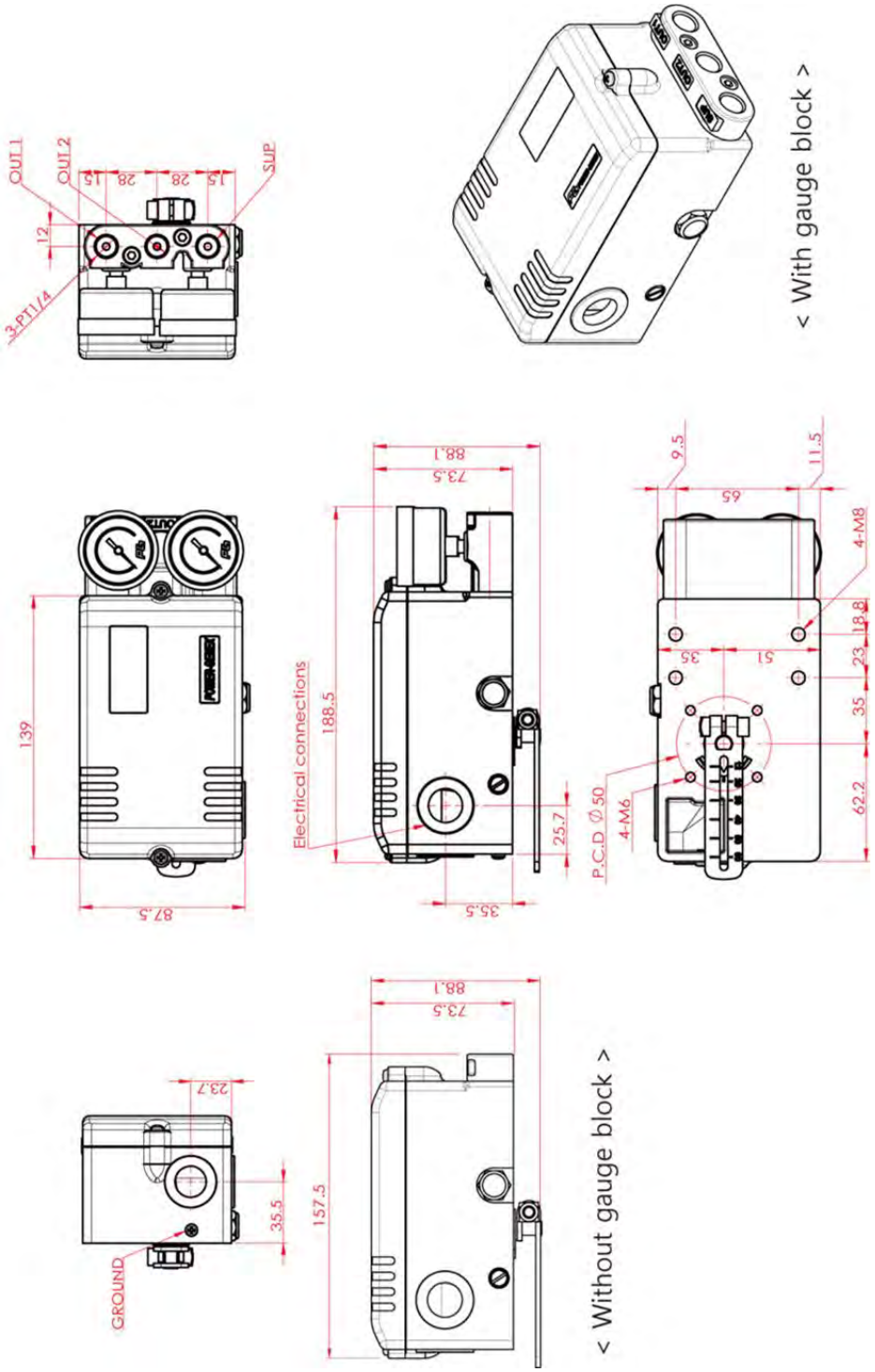


14.3. List of Spare Parts

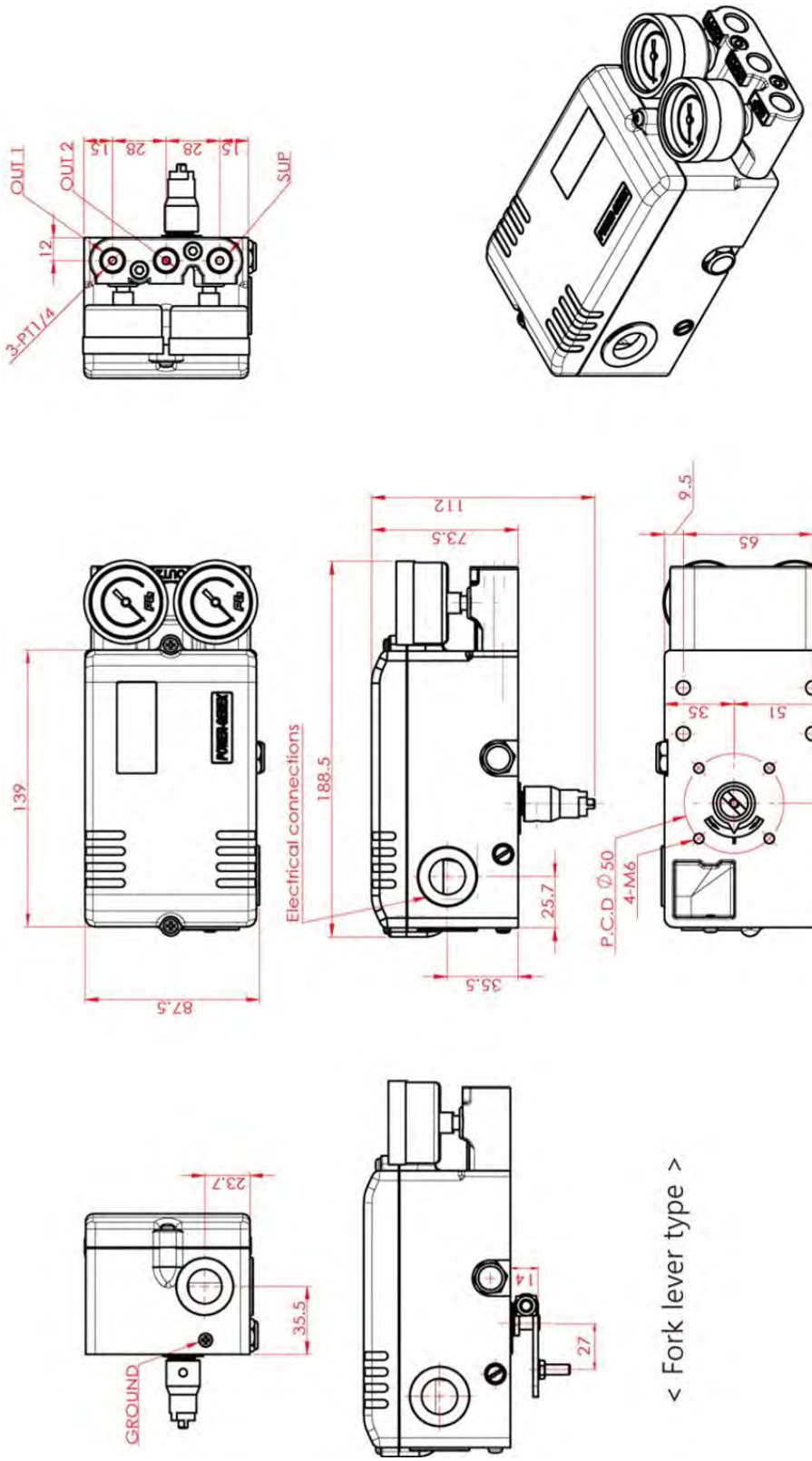
No.	Part No.	Description
1	S2CO-01	SS2 cover
2	S2BO-03	PCB control board cover
3	BOARD-37	PCB control board module
4	S2BO-08	Pilot valve cover
5	PILOT VALVE-6	Pilot valve module
6	S2BO-06	Body air line cover
7	S2BO-07	Air line O-ring
8	S2BO-01	SS2 body
9	RUB-52	Gauge block O-ring P10
10	S2BO-02	SS2 gauge block (G)
11	S2BO-02N	SS2 block (N)
12	TQ-SS2&3	RTQ coil module
13	S2TQ-02	RTQ coil cover
14	S2BO-09	SS2 potentiometer bracket
15	GEAR-11, SH-36	SS2 main shaft & gear
16L	LEVER-05 ~ 08	SS2 feedback lever
16R	SH-38	SS2&3 rotary feedback joint
17L	BR-12	SS2&3 linear bracket
17R	BR-13,14	SS2&3 rotary bracket
18	77	Cable gland PG16
19	79	Screw plug

15. Dimensions

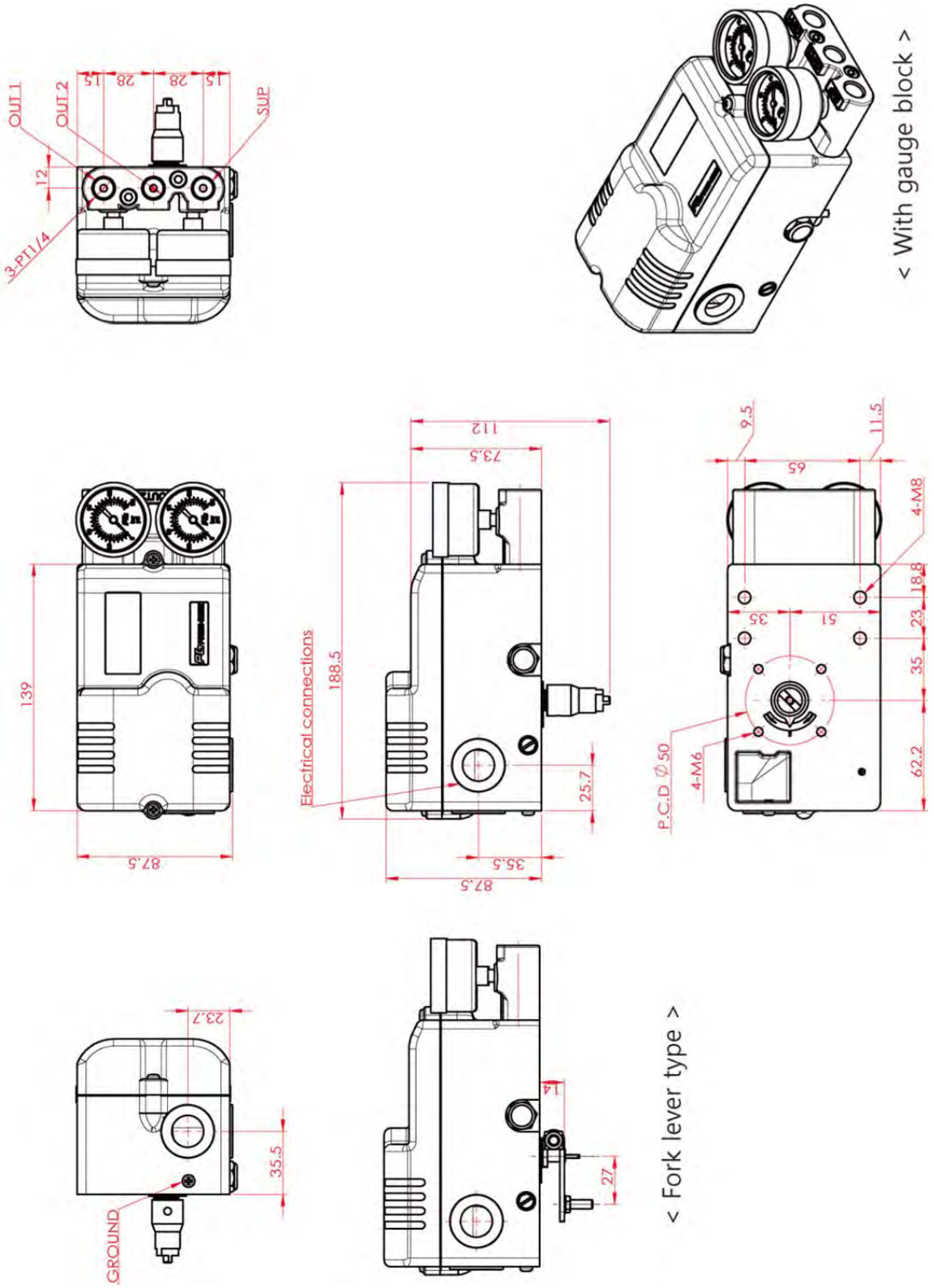
15.1. SS2L (linear type)



15.2. SS2R (rotary type)



15.3. SS2R (with 2 x SPDT micro switch)



Warranty

1. **The warranty period of the product is 1.5 years after the product is shipped from Power-Genex in Korea.**

2. **For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.**

3. **If a problem happens with the following reasons, please note that the reasonable repairing costs will be charged even during a warranty period.**

- **In case that customers retro-fit the products improperly without any instructions from Power-Genex**
- **In case that the products are damaged by a bad delivery, storage or handling beyond design conditions**
- **In case that the products are used beyond specifications**
- **In case that the products are damaged by an improper installation**
- **In case that the products are damaged by fire, earthquake, storm, flood, thunder, lighting, other natural disasters, riot, war, exposure to radioactivity**

4. **If maintenance is required, please contact distributors or Power-Genex directly. A proper and satisfactory customer service will be provided.**

Subject to change without prior notice

16. Certificati

16.1 ATEX (Ineris) Ex ia IIC T5/T6

POWER-GENEX

CE **EU Declaration of Conformity** Ex

We herewith declare . **Power-Genex Ltd.**
99, Eunbong-ro, Namdong-gu,
Incheon 21639 Korea

declare that the DoC is issued under our sole responsibility and belongs to the following product:

Product Name : Smart Valve Positioner
Product Model : SS2, SS2S Series

The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

EMC Directive 2004/108/EC(until 19th April, 2016) and
EMC Directive 2014/30/EU(from 20th April, 2016)

ATEX Directive 94/9/EC(until 19th April, 2016) and
ATEX Directive 2014/34/EU(from 20th April, 2016)

The following harmonised standards and technical specifications have been applied:
EN 61000-6-1 : 2007 / EN 61000-6-2 : 2005 / EN61000-6-3 : 2007 / EN 61000-6-4 : 2007
EN 60079-0 : 2009 / EN 60079-11 : 2007 / EN 60079-26 : 2007

EC-Type Examination Certificate : INERIS 13ATEX0046X

Conformity with the requirements of these Directives is proven by complete adherence to the following standards.

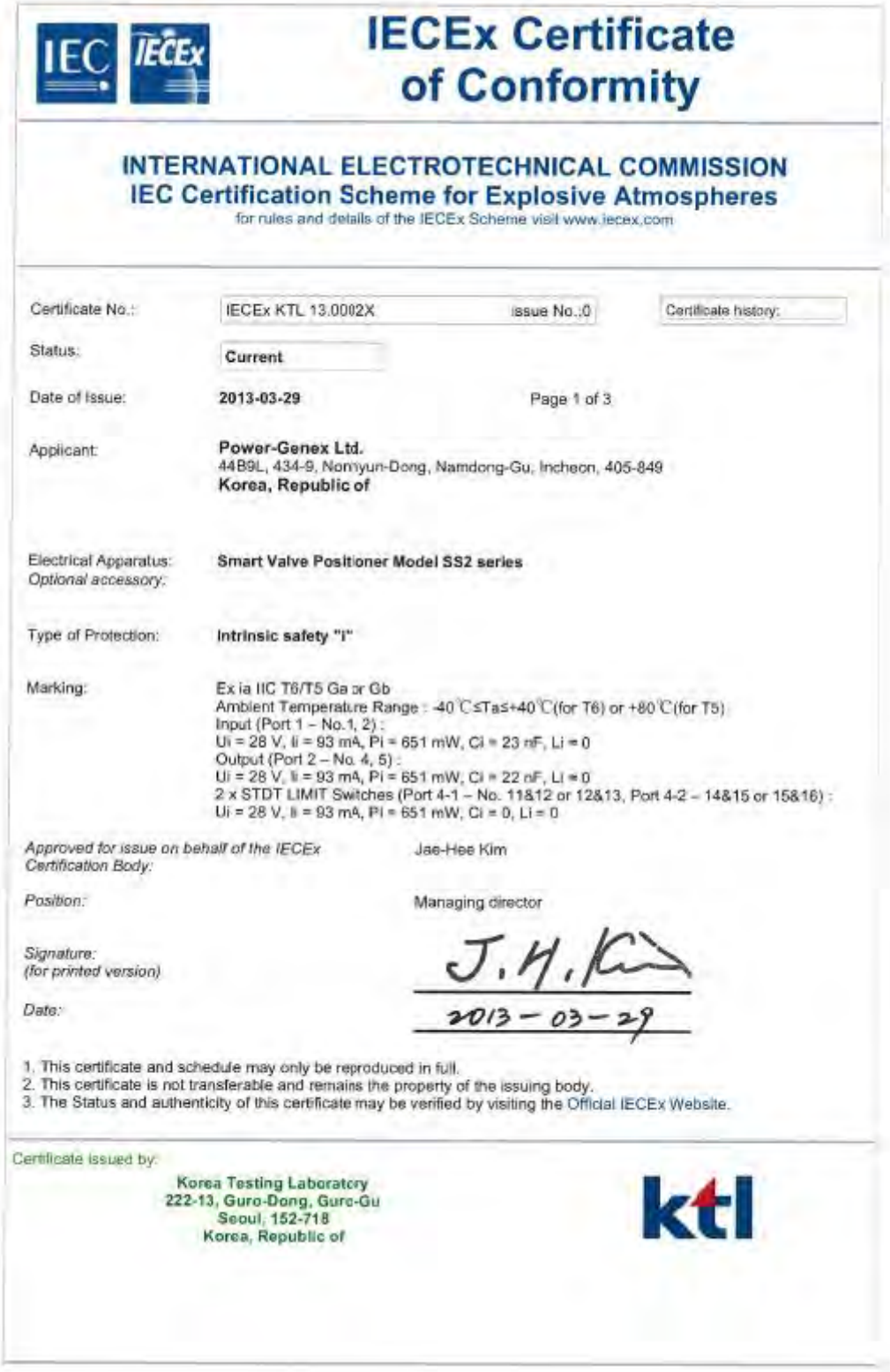
- Date : Apr 20, 2016

Koh Sung-won, Head of R&D

Lee Soon-hyuk, Head of Quality Management

This declaration certifies the conformity to the specified directives but contains no assurance of properties.

16.2 – IECEx Ex ia IIC T6/T5



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres
for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx KTL 13.0002X issue No.:0 Certificate history:

Status: **Current**

Date of Issue: **2013-03-29** Page 1 of 3

Applicant: **Power-Genex Ltd.**
44B9L, 434-9, Nonhyun-Dong, Namdong-Gu, Incheon, 405-849
Korea, Republic of

Electrical Apparatus: **Smart Valve Positioner Model SS2 series**
Optional accessory:

Type of Protection: **Intrinsic safety "i"**

Marking: Ex ia IIC T6/T5 Ga or Gb
Ambient Temperature Range : -40℃≤Ta≤+40℃(for T6) or +80℃(for T5)
Input (Port 1 – No.1, 2) :
Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 23 nF, Li = 0
Output (Port 2 – No. 4, 5) :
Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 22 nF, Li = 0
2 x STDT LIMIT Switches (Port 4-1 – No. 11&12 or 12&13, Port 4-2 – 14&15 or 15&16) :
Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0

Approved for issue on behalf of the IECEx Certification Body: Jae-Hee Kim

Position: Managing director

Signature: (for printed version) J. H. Kim

Date: 2013-03-29

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:
Korea Testing Laboratory
222-13, Guro-Dong, Guro-Gu
Seoul, 152-718
Korea, Republic of

IECEx Certificate of Conformity

Certificate No.: IECEx KTL 13.0002X

Date of Issue: **2013-03-29** Issue No.: **0**

Page 2 of 3

Manufacturer: **Power-Genex Ltd.**
44B9L, 434-9, Nonhyun-Dong, Namdong-Gu, Incheon, 405-849
Korea, Republic of

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2007-10 Explosive atmospheres - Part 0:Equipment - General requirements
Edition: 5
IEC 60079-11 : 2006 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition: 5

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
KR/KTL/ExTR13.0008/00

Quality Assessment Report:

KR/KTL/QAR11.0002/00 KR/KTL/QAR11.0002/01

IECEx Certificate of Conformity

Certificate No.: IECEx KTL 13.0002X

Date of Issue: 2013-03-29 Issue No.: 0

Page 3 of 3

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

The Model SS2 Smart Valve Positioner is an intrinsically safe equipment that is applied in hazardous area, which is used for control of linear and rotary valve position. The equipment comprises a pilot valve, a feedback lever(Shaft), a pressure gauge block, a torque motor assembly, a main control board and so on. They are housed in an aluminium or stainless steel enclosure. The valve is controlled by the main control board and the torque motor through a 4~20mA input signal and a position feedback signal from a potentiometer. The optional output signal for position feedback to external systems is generated by one of a 4~20mA position transmitter, 2 SPDT limit switches and their combination. 24V DC power is transmitted to the equipment and all external connections from safe area shall be provided to the equipment through an intrinsically safe barrier.
<Model code description>
SS2ab-cdefghijk
a=Body material : Blank-Aluminum, S-316SS
b=Actuator action : L-Linear type, R-Rotary type
c=Ex Protection type : I-Intrinsic safety (Ex ia IIC T6/T5)
d*=Feedback lever(Shaft) : A, B, C, D, F, N
e*=Pressure gauge : 0, 1, 2
f*=BY-Pass : N, Y
g=Position feedback : N, O, S, Q
h*=Communication : N
i=Pneumatic-Electrical connections : 3, 4, 5
j*=Mounting bracket : N, L, R
k*=Feedback pin guide : 0, 1
* ; Options which do not affect intrinsic safety
For the detailed information, refer to the instruction manual.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. Warning-Potential electrostatic charging hazard-see instructions.
The non-metallic parts incorporated in the enclosure of this equipment may generate an ignition capable level of electrostatic charge. Therefore particularly when it used for applications that specifically require Group IIC, EPL Ga equipment, the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.

2. Models with enclosures made of aluminium are considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction. Particularly, it must not be used for applications that specifically require EPL Ga equipment.

3. The insulation between an intrinsically safe circuit and a frame of the equipment is not capable of withstanding a 500V dielectric strength test as defined in Cl.6.3.12 of IEC 60079-11:2006. This shall be taken into account during installation.

IECEx Technical Report: KR/KTL/ExTR13.0008/00 details

ExTR :

ExTR Reference Number *: (automatic numbering)	KR/KTL/ExTR13.0008/00
Status*:	Issued
ExTR Free Reference Number*:	PIS11341
Date of Issue*: (yyyy-mm-dd)	2013-03-29
List of Standards Covered*:	IEC 60079-0 (Ed.5); IEC 60079-11 (Ed.5); IEC 60079-26 (Ed.2)
Issuing ExTL*:	KTL - Korea Testing Laboratory
Endorsing ExCB*:	KTL - Korea Testing Laboratory
Manufacturer*:	Power-Genex Ltd. 44B9L, 434-9, Nonhyun-Dong, Namdong-Gu, Incheon, 405-849, Korea
Country of Manufacture*:	Korea, Republic of
Ex Protection*:	Intrinsic safety "i" Ex ia IIC T6/T5 Ga or Gb
Ratings:	▪ Ambient Temperature Range -40℃ ≤ Ta ≤ +40℃(for T6) or +80℃(for T5) ▪ Electrical Ratings : DC 24V, 4~20mA ▪ Maximum intrinsically safe parameters - Input (Port 1 – No.1, 2) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 23 nF, Li ≈ 0 - Output (Port 2 – No. 4, 5) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 22 nF, Li ≈ 0 - 2 x STDT LIMIT Switches (Port 4-1 – No. 11&12 or 12&13, Port 4-2 – 14&15 or 15&16) Ui = 28 V, Ii = 93 mA, Pi = 651 mW, Ci = 0, Li = 0
Product*:	Smart Valve Positioner Model SS2 Series
Model Reference*:	SS2ab-cdefghijk a=Body material : Blank-Aluminum, S-316SS b=Actuator action : L-Linear type, R-Rotary type c=Ex Protection type : I-Intrinsic safety (Ex ia IIC T6/T5) d*=Feedback lever(Shaft) : A, B, C, D, F, N e*=Pressure gauge : 0, 1, 2 f*=BY-Pass : N, Y g=Position feedback : N, O, S, Q h*=Communication : N i=Pneumatic–Electrical connections : 3, 4, 5 j*=Mounting bracket : N, L, R k*=Feedback pin guide : 0, 1 * : Options which do not affect intrinsic safety For the detailed information, refer to the instruction manual.
Related IECEx Certificates:	IECEx KTL 13.0002X issue: 0 [Current]
Comment:	
Attachment:	

Last modified: 2013-03-29 오전 09:48:31

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16.3 – KC(KTL) Ex ia IIC T6/T5



No. 2013-014874-01

안 전 인 증 서

Certificate of Safety

Power-Genex Ltd.

44B-9L, 434-9, Nonhyun-Dong, Namdong-Gu, Incheon, 405-849, Korea

The following product produced by the above company has been authorized for the use of the safety certification marking as the product has satisfied the safety and health requirements stipulated in the article 34 of Industrial Safety and Health Law and the clause 4 of paragraph 4 of article 58 of enforcement regulations for the law.

Electrical Equipment

Smart Valve Positioner

Model (Marking) / Certificate No.

SS2 Series (Ex ia IIC T6/T5 Ga or Gb) / 13-KB2BO-0155X

Applied standards

Notification No. 2010-36 of the Ministry of Employment and Labor

Conditions of Certification

1. **Manufacturing location(s)** : This certificate is only valid for the specified products produced at '44B9L, 434-9, Nonhyun-Dong, Namdong-Gu, Incheon, 405-849, Korea'
2. **Description of equipment**
   Rating : Input DC 24V, Output 4~20mA
   Input (Port 1-No.1, 2) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 23 nF, L_i = 0
   Output (Port 2 - No. 4, 5) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 22 nF, L_i = 0
   2 x STDT LIMIT Switches (Port 4-1-No. 11&12 or 12&13, Port 4-2-14&15 or 15&16) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 0, L_i = 0
   Ambient Temperature : -40 ℃ ≤ Ta ≤ +40 ℃ (for T6) or +80 ℃ (for T5)
3. **Scope of certification** : This certificate is only valid for the models as above.
4. **Special conditions for safe use**
   Warning-Potential electrostatic charging hazard - see instructions.
   Models with enclosures made of aluminium are considered to present a potential risk of ignition by impact or friction. Care must be taken during installation and use to prevent impact or friction. Particularly, it must not be used for applications that specifically require Zone 0 equipment.
   The insulation between an intrinsically safe circuit and a frame of the equipment is not capable of withstanding a 500V dielectric strength test. This shall be taken into account during installation.
5. **Details of certificate changes** : None
6. **Details of the others** : None

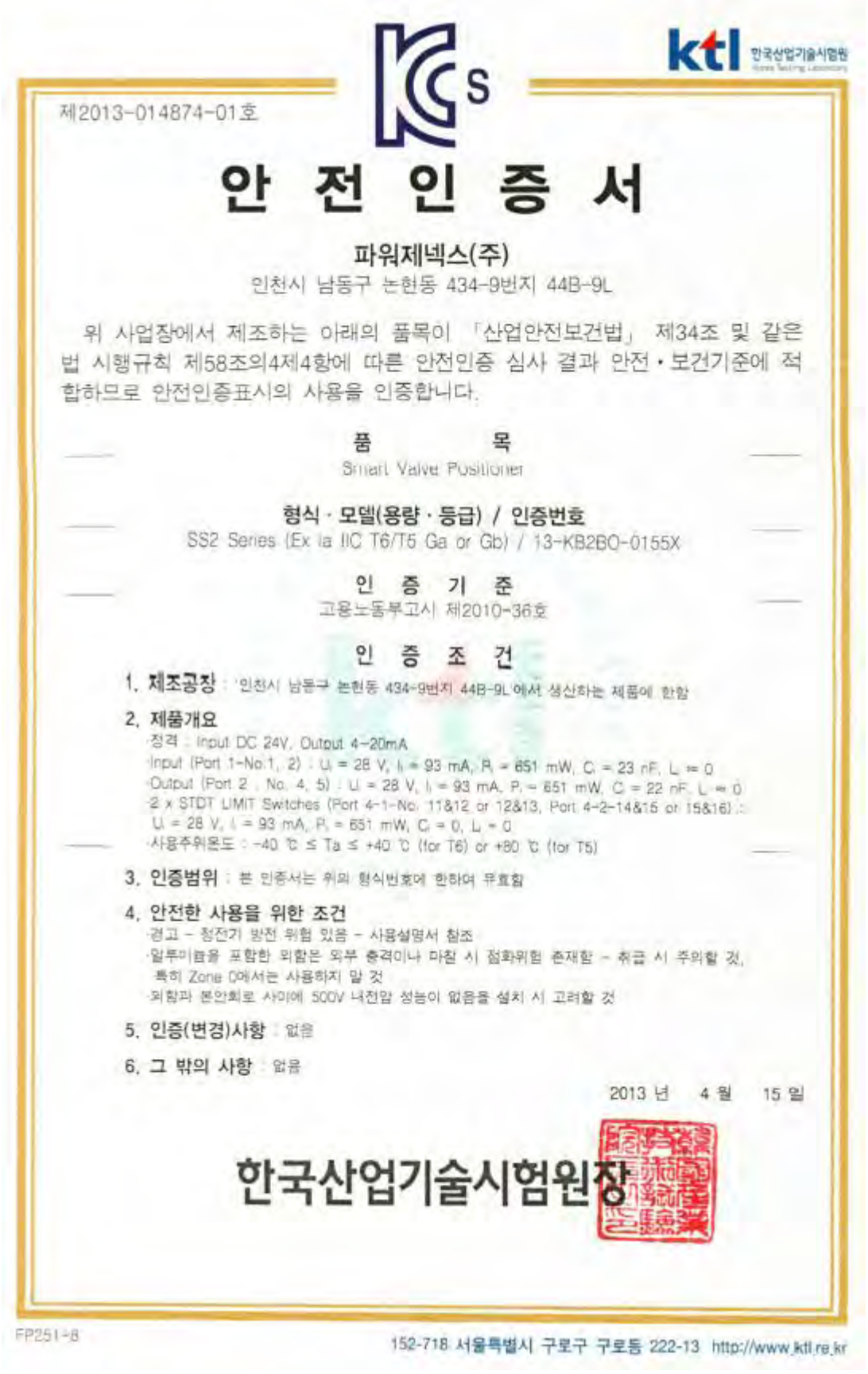
Date of Issue : 2013-4-15

한국산업기술시험원장

KOREA TESTING LABORATORY

FP251-8

152-718 서울특별시 구로구 구로동 222-13 http://www.ktl.re.kr



제2013-014874-01호

안 전 인 증 서

파워제넥스(주)

인천시 남동구 논현동 434-9번지 44B-9L

위 사업장에서 제조하는 아래의 품목이 「산업안전보건법」 제34조 및 같은 법 시행규칙 제58조의4제4항에 따른 안전인증 심사 결과 안전·보건기준에 적합하므로 안전인증표시의 사용을 인증합니다.

품 목

Smart Valve Positioner

형식 · 모델(용량 · 등급) / 인증번호

SS2 Series (Ex ia IIC T6/T5 Ga or Gb) / 13-KB2BO-0155X

인 증 기 준

고용노동부고시 제2010-36호

인 증 조 건

1. **제조공장** : 인천시 남동구 논현동 434-9번지 44B-9L 에서 생산하는 제품에 한함
2. **제품개요**
   - 정격 : Input DC 24V, Output 4-20mA
   - Input (Port 1-No.1, 2) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 23 nF, L_i = 0
   - Output (Port 2 , No. 4, 5) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 22 nF, L_i = 0
   - 2 x STDT LIMIT Switches (Port 4-1-No. 11&12 or 12&13, Port 4-2-14&15 or 15&16) : U_i = 28 V, I_i = 93 mA, P_i = 651 mW, C_i = 0, L_i = 0
   - 사용주위온도 : -40 ℃ ≤ Ta ≤ +40 ℃ (for T6) or +80 ℃ (for T5)
3. **인증범위** : 본 인증서는 위의 형식번호에 한하여 유효함
4. **안전한 사용을 위한 조건**
   - 경고 - 정전기 발전 위험 있음 - 사용설명서 참조
   - 알루미늄을 포함한 외함은 외부 충격이나 마찰 시 점화위험 존재함 - 취급 시 주의할 것, 특히 Zone 0에서는 사용하지 말 것
   - 외함과 본안회로 사이에 500V 내전압 성능이 없음을 설치 시 고려할 것
5. **인증(변경)사항** : 없음
6. **그 밖의 사항** : 없음

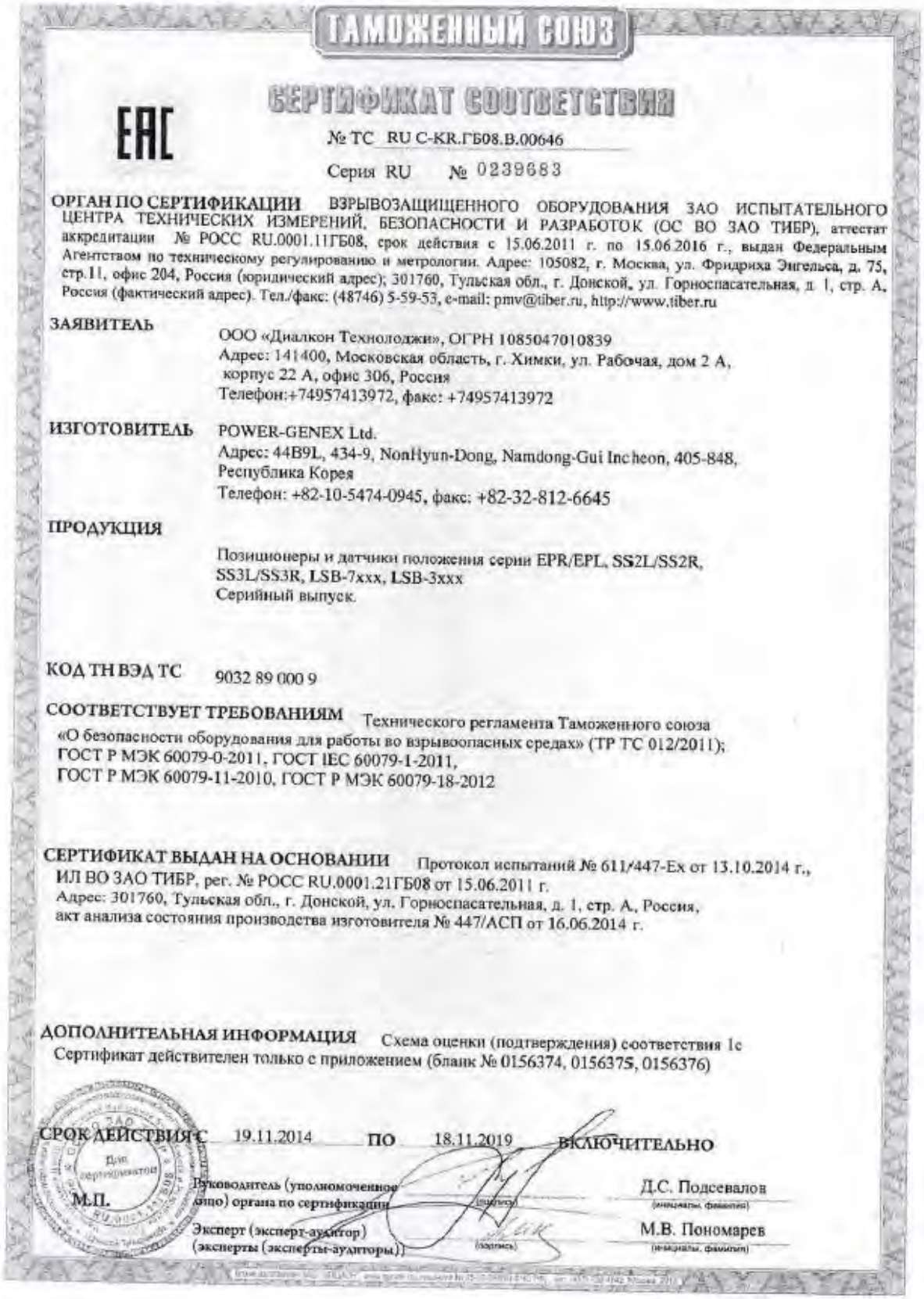
2013 년 4 월 15 일

한국산업기술시험원장

FP251-8

152-718 서울특별시 구로구 구로동 222-13 http://www.ktl.re.kr

16.4 – GOST (EAC) Ex ia IIC



ТАМОЖЕННЫЙ СОЮЗ

СЕРТИФИКАТ СООТВЕТСТВИЯ

EAC

№ ТС RU C-KR.ГБ08.В.00646

Серия RU № 0239683

ОРГАН ПО СЕРТИФИКАЦИИ ВЗРЫВОЗАЩИЩЕННОГО ОБОРУДОВАНИЯ ЗАО ИСПЫТАТЕЛЬНОГО ЦЕНТРА ТЕХНИЧЕСКИХ ИЗМЕРЕНИЙ, БЕЗОПАСНОСТИ И РАЗРАБОТОК (ОС ВО ЗАО ТИБР), аттестат аккредитации № РОСС RU.0001.11ГБ08, срок действия с 15.06.2011 г. по 15.06.2016 г., выдан Федеральным Агентством по техническому регулированию и метрологии. Адрес: 105082, г. Москва, ул. Фридриха Энгельса, д. 75, стр.11, офис 204, Россия (юридический адрес); 301760, Тульская обл., г. Донской, ул. Горноспасательная, д. 1, стр. А, Россия (фактический адрес). Тел./факс: (48746) 5-59-53, e-mail: pmv@tiber.ru, http://www.tiber.ru

ЗАЯВИТЕЛЬ ООО «Диалкон Технолоджи», ОГРН 1085047010839
Адрес: 141400, Московская область, г. Химки, ул. Рабочая, дом 2 А, корпус 22 А, офис 306, Россия
Телефон:+74957413972, факс: +74957413972

ИЗГОТОВИТЕЛЬ POWER-GENEX Ltd.
Адрес: 44B9L, 434-9, NonHyun-Dong, Namdong-Gui Incheon, 405-848, Республика Корея
Телефон: +82-10-5474-0945, факс: +82-32-812-6645

ПРОДУКЦИЯ

Позиционеры и датчики положения серии EPR/EPL, SS2L/SS2R, SS3L/SS3R, LSB-7xxx, LSB-3xxx
Серийный выпуск.

КОД ТН ВЭД ТС 9032 89 000 9

СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ Технического регламента Таможенного союза «О безопасности оборудования для работы во взрывоопасных средах» (ТР ТС 012/2011); ГОСТ Р МЭК 60079-0-2011, ГОСТ IEC 60079-1-2011, ГОСТ Р МЭК 60079-11-2010, ГОСТ Р МЭК 60079-18-2012

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ Протокол испытаний № 611/447-Ex от 13.10.2014 г., ИЛ ВО ЗАО ТИБР, рег. № РОСС RU.0001.21ГБ08 от 15.06.2011 г.
Адрес: 301760, Тульская обл., г. Донской, ул. Горноспасательная, д. 1, стр. А, Россия, акт анализа состояния производства изготовителя № 447/АСП от 16.06.2014 г.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ Схема оценки (подтверждения) соответствия 1с
Сертификат действителен только с приложением (бланк № 0156374, 0156375, 0156376)

СРОК ДЕЙСТВИЯ С 19.11.2014 **ПО** 18.11.2019 **ВКЛЮЧИТЕЛЬНО**

М.П.

Руководитель (уполномоченное лицо) органа по сертификации — Д.С. Подсевалов

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — М.В. Пономарев

ТАМОЖЕННЫЙ СОЮЗ

ПРИЛОЖЕНИЕ

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ТС RU C-KR.ГБ08.В.00646

Серия RU № 0156374

1. Назначение и область применения.

Позиционеры серий EPR/EPL, SS2L/SS2R, SS3L/SS3R предназначены для преобразования управляющего сигнала (электрического или пневматического) в угол поворота исполнительного механизма.

Датчик положения LSB-3xxx, LSB-7xxx предназначены для регистрации состояния положения.

Позиционеры и датчики предназначены для применения во взрывоопасных зонах в соответствии с присвоенной маркировкой взрывозащиты.

2. Описание конструкции и средств обеспечения взрывозащиты.

Позиционеры серий EPR/EPL представляют собой алюминиевый корпус с антикоррозионным покрытием, внутри которого помещены электрические и механические части. На корпусе имеется блок индикаторов-манометров, визуальный индикатор положения (только для EPR/EPL), ЖК экран (только для SS2L/SS2R, SS3L/SS3R).

Датчик положения LSB-3xxx, LSB-7xxx представляет алюминиевый корпус с антикоррозионным покрытием, внутри которого помещены электрические части.

3. Специальные условия применения.

3.1. Позиционеры серий EPR/EPL, SS2L/SS2R, SS3L/SS3R, имеют риска разряда статического электричества, протирать только влажной тканью и обеспечить возможность стекания статического электричества.

3.2. У позиционеров серий EPR/EPL, SS2L/SS2R изоляция между искробезопасными цепями и корпусом не способны выдержать испытания 500 В на электрическую прочность. Это должно быть принято во внимание во время установки.

3.3. Позиционеры серий EPR/EPL, SS3L/SS3R запрещено открывать при возможности присутствии взрывоопасных газов или при существовании опасности воспламенения горючей пыли.

3.4. Позиционеры серий EPR/EPL, SS3L/SS3R и датчик положения LSB-7xxx имеют зазор меньше, чем максимально допустимый зазор, установленный ГОСТ IEC 60079-1-2011. Ответственность за недопущение превышения максимально допустимого зазора между корпусом и крышкой, возлагается на потребителя данного оборудования.

3.5. Датчик положения LSB-7xxx, LSB-3xxx имеют риски разряда статического электричества, протирать только влажной тканью и обеспечить возможность стекания статического электричества. Запрещено открывать при возможности присутствии взрывоопасных газов или при существовании опасности воспламенения горючей пыли.

4. Маркировка.

Маркировка, наносимая на оборудование должна включать следующие данные:

1) наименование изготовителя или его зарегистрированный товарный знак;
2) обозначение типа оборудования;
3) заводской номер;
4) номер сертификата соответствия;
5) маркировку взрывозащиты

Позиционеры серий EPR и EPL - **0 Ex ia IIC T6 Ga X/II Gb c T6 X**

1 Ex d mb IIC «T6/T5» Gb X/II Gb c T6/T5 X

Позиционеры серий SS2L/SS2R - **0 Ex ia IIC «T6-T5» Ga X/II Gb c T6-T5 X**

Позиционеры серий SS3L/SS3R – **1 Ex d IIC T6 Gb X/II Gb c T6**

Датчик положения LSB-7xxx - **1 Ex d IIB+H2 T6 Gb X**

Датчик положения LSB-3xxx - **1 Ex d IIC «T6/T5/T4 Gb» X**

6) изображение специального знака взрывобезопасности установлено в ТР ТС 012/2011 (приложение 2)

М.П.

Руководитель (уполномоченное лицо) органа по сертификации — (подпись) — Д.С.Подсевалов (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — (подпись) — М.В. Пономарев (инициалы, фамилия)

ТАМОЖЕННЫЙ СОЮЗ

ПРИЛОЖЕНИЕ

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ТС RU C-KR.ГБ08.В.00646

Серия RU № 0156375

5. Основные технические данные.

5.1. Позиционеры серий EPR/EPL (0 Ex ia IIC T6 Ga X/II Gb c T6 X)

5.1.1. Искробезопасные параметры

Ui, В 28

Ii, мА 100

Pi, мВт 1

Ci ..... пренебрежимо мало

Li, мкГц 2

5.1.2. Входной/выходной сигнал, мА ..... 4 – 20

5.1.3. Температура окружающей среды, °С ..... от минус 20 до +70

5.2. Позиционеры серий EPR/EPL (1 Ex d mb IIC «T6/T5» Gb X/II Gb c T6/T5 X)

5.2.1. Температура окружающей среды, °С ..... от минус 40 до +55 (для T6), до +70 (для T5)

5.2.2. Входной/выходной сигнал, мА ..... 4 – 20

5.2.3. Входной сигнал, В (DC) 24

5.2.4. Входной/выходной сигнал, В (AC) 125/250

5.2.5. Входной/выходной сигнал, В (DC) 125/250

5.2.6. Степень защиты оболочки по ГОСТ 14254-96 ..... IP66

5.3. Позиционеры серий SS2L/SS2R (0 Ex ia IIC «T6-T5» Ga X/II Gb c T6-T5 X)

5.3.1. Искробезопасные параметры

(Port 1)

Ui, В 28

Ii, мА 93

Pi, мВт 651

Ci, нФ 23

Li, мкГц ..... пренебрежимо мало

(Port 2)

Ui, В 28

Ii, мА 93

Pi, мВт 651

Ci, нФ 22

Li, мкГц ..... пренебрежимо мало

(Port 4-I)

Ui, В 28

Ii, мА 93

Pi, мВт 651

Ci, нФ ..... пренебрежимо мало

Li, мкГц ..... пренебрежимо мало

5.3.2. Входной/выходной сигнал, мА ..... 4 – 20

5.3.3. Температура окружающей среды, °С ..... от минус 40 до +40 (для T6), до +80 (для T5)

М.П.

Руководитель (уполномоченное лицо) органа по сертификации — (подпись) — Д.С.Подсевалов (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — (подпись) — М.В. Пономарев (инициалы, фамилия)

ТАМОЖЕННЫЙ СОЮЗ

ПРИЛОЖЕНИЕ

К СЕРТИФИКАТУ СООТВЕТСТВИЯ № ТС RU C-KR.ГБ08.В.00646

Серия RU № 0156376

5.4. Позиционеры серий SS3L/SS3R – (1 Ex d IIC T6 Gb X/II Gb c T6)
5.4.1. Входной/выходной сигнал, мА ..... 4 – 20
5.4.2. Входной сигнал, В (DC) 24
5.4.3. Входной/выходной сигнал, В (AC) 250
5.4.4. Входной сигнал, В (DC) ..... 9 – 32
5.4.5. Max/min токи, мА 3,6/50
5.4.6. Степень защиты оболочки по ГОСТ 14254-96 ..... IP66
5.4.7. Температура окружающей среды, ^{0}C ..... от -30 до +75
5.5. Датчик положения LSB-7xxx – (1 Ex d IIB+H2 T6 Gb X)
5.5.1. Напряжение, В ..... 220 (AC)/110(AC)/24 (DC)/48(DC)
5.5.2. Степень защиты оболочки по ГОСТ 14254-96 ..... IP67
5.5.3. Входной/выходной сигнал, мА ..... 4 – 20
5.5.4. Входной/выходной сигнал, В ..... 8(DC)/8.2(DC)/24(DC)/30(DC)/120(AC)/125(AC)/240(AC)/250(AC)
5.5.5. Температура окружающей среды, ^{0}C ..... от минус 30 до +75
5.6. Датчик положения LSB-3xxx – (1 Ex d IIC «T6/T5/T4 Gb» X)
5.6.1. Напряжение. В ..... 220 (AC)/110(AC)/24 (DC) /48(DC)
5.6.2. Степень защиты оболочки по ГОСТ 14254-96 ..... IP67
5.6.3. Входной/выходной сигнал, В ..... 8(DC)/8.2(DC)/24(DC)/30(DC)/120(AC)/125(AC)/240(AC)/250(AC)
5.6.4. Температура окружающей среды, ^{0}C .от минус 40 до +75(для T6), до +80 (для T5), до +125 (для T4)

При внесении изготовителем в конструкцию и (или) техническую документацию, подтверждающую соответствие оборудования и (или) Ex-компонента требованиям ТР ТС 012/2011, изменений, влияющих на показатели взрывобезопасности оборудования, он должен предоставить в ОС ВО ЗАО ТИБР, описание изменений, техническую документацию (чертежи средств обеспечения взрывозащиты) с внесенными изменениями и образец для проведения дополнительных испытаний, если ОС ВО ЗАО ТИБР посчитает недостаточным проведение только экспертизы технической документации с внесенными изменениями для принятия решения о соответствии оборудования и (или) Ex-компонента ТР ТС 012/2011 с внесенными изменениями.

М.П.

Руководитель (уполномоченное лицо) органа по сертификации — (подпись) — Д.С.Подсевалов (инициалы, фамилия)

Эксперт (эксперт-аудитор) (эксперты (эксперты-аудиторы)) — (подпись) — М.В. Пономарев (инициалы, фамилия)

16.5 – HART


HART
COMMUNICATION FOUNDATION
CERTIFICATE OF MEMBERSHIP
THE BOARD OF DIRECTORS HEREBY ACKNOWLEDGES THAT
Power-Genex Ltd.
HAS ACCEPTED AND FULFILLED THE REQUIREMENTS OF THE BYLAWS
AND ALL RIGHTS AND PRIVILEGES OF MEMBERSHIP ARE HEREBY GRANTED
June 2013 – May 2014
Membership Term
BY
Executive Director
THE OFFICIAL SOURCE FOR THE HART COMMUNICATION PROTOCOL
CELEBRATING 20 YEARS
1993-2013

16.6 – PROFIBUS

PROFIBUS · PROFINET

Certificate

PROFIBUS Nutzerorganisation e.V. grants to

Power-Genex Ltd.
44B9L, 434-9, Nonhyun-ding, Namdong-gu
406-848 Incheon, South-Korea

the Certificate No: **Z01802** for the PROFIBUS Device:

Model Name:	**SSPA**
Revision:	**1.0; SW/FW: 01.00; HW: 01.00**
GSD:	**PWGX0E19.GSD, File Version: 5.0**
	pa139710.gsd

This certificate confirms that the product has successfully passed the certification tests with the following scope:

☑ DP-V0	MS0, Sync, Freeze, Fail_Safe, Set_Slave_Add
☑ DP-V1	MS1, Prm_Block_Structure, MS2, I&M
☑ Profile	PROFIBUS PA 3.02
☑ Physical Layer	MBP

Test Report Number: **MCDL-2013-562-D**
Authorized Test Laboratory: **ITEI, Beijing, China**

The tests were executed in accordance with the following documents:
"Test Specifications for PROFIBUS DP Slaves, Version 3.0.9, September 2008" and
"Test Specifications for PROFIBUS PA Profile 3.0.2, Version 5.0.4, February 2010".
This certificate is granted according to the document:
"Framework for testing and certification of PROFIBUS and PROFINET products".
For all products that are placed in circulation by October 15, 2016 the certificate is valid for life.

Board of PROFIBUS Nutzerorganisation e. V.

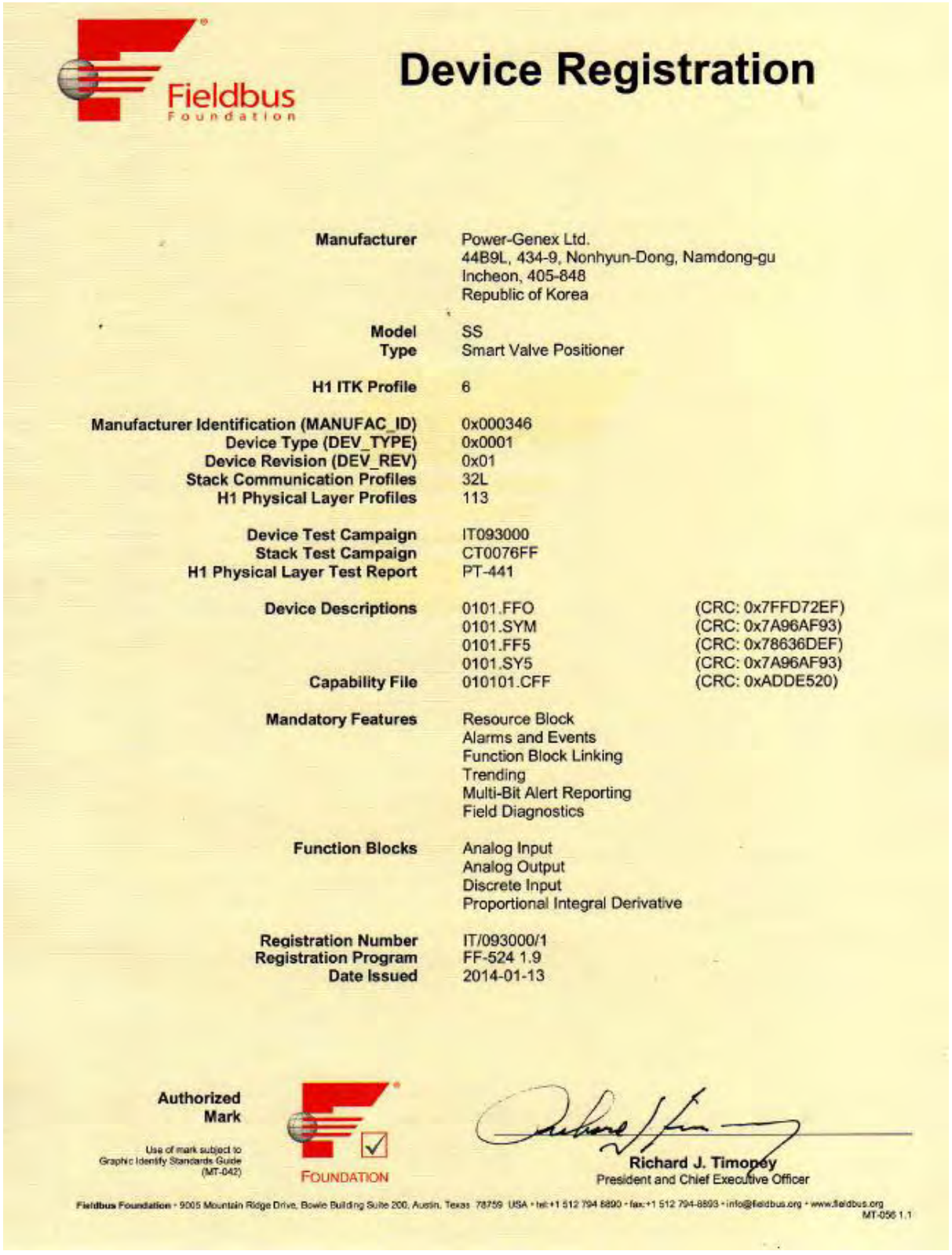
(Official in Charge)

(Karsten Schneider)

(K.-P. Lindner)

PROFIBUS®

16.7 – FIELDBUS



Fieldbus Foundation

Device Registration

Manufacturer	Power-Genex Ltd. 44B9L, 434-9, Nonhyun-Dong, Namdong-gu Incheon, 405-848 Republic of Korea	
Model	SS	
Type	Smart Valve Positioner	
H1 ITK Profile	6	
Manufacturer Identification (MANUFAC_ID)	0x000346	
Device Type (DEV_TYPE)	0x0001	
Device Revision (DEV_REV)	0x01	
Stack Communication Profiles	32L	
H1 Physical Layer Profiles	113	
Device Test Campaign	IT093000	
Stack Test Campaign	CT0076FF	
H1 Physical Layer Test Report	PT-441	
Device Descriptions	0101.FFO	(CRC: 0x7FFD72EF)
	0101.SYM	(CRC: 0x7A96AF93)
	0101.FF5	(CRC: 0x78636DEF)
	0101.SY5	(CRC: 0x7A96AF93)
Capability File	010101.CFF	(CRC: 0xADDE520)
Mandatory Features	Resource Block Alarms and Events Function Block Linking Trending Multi-Bit Alert Reporting Field Diagnostics	
Function Blocks	Analog Input Analog Output Discrete Input Proportional Integral Derivative	
Registration Number	IT/093000/1	
Registration Program	FF-524 1.9	
Date Issued	2014-01-13	

Authorized Mark

Use of mark subject to Graphic Identity Standards Guide (MT-042)

FOUNDATION

Richard J. Timoney
President and Chief Executive Officer

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MT-056 1.1

CONFLOW s.p.a.
FLOW CONTROL SOLUTIONS

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E-mail: servicing@conflow.it
Web: www.conflow.it

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Fax: +39.(0)39.65.40.18