SEOJEON VALMAC

SP-2300 Series
Digital Rotary Positioner

VALMAC SP-2300 Series is the advanced control device that provides precise control and unparalleled stability in difficult environments

Features

· Precise control performance and high dynamic response
· Simple and easy to set
· Pressure regulator built in to eliminate variations in supply air pressure
· Low air consumption due to piezo electric microvalve
· Output speed controller (output 1, 2) built in as standard
· Input / output signal isolated
· Split range available (4…12 or 12…20mA)
· Simple conversion to direct acting and reverse acting
· Single and double acting available
· No hunting at small actuators
· Limit switches and position transmitter to be built in one unit
· High resistance against shock and vibration
· Modular design to provide good serviceability
· NAMUR mounting standard easy to mount to the actuator
· Fail in last position upon loss of the input signal
· Very compact and light
· Options available:
  - position transmitter (output 4…20mA)
  - limit switches (open and close at any two points)
  - dome indicator
  - gauge block (two gauges)
  - fail in last position (on request)

SP-2300 (rotary flat type)

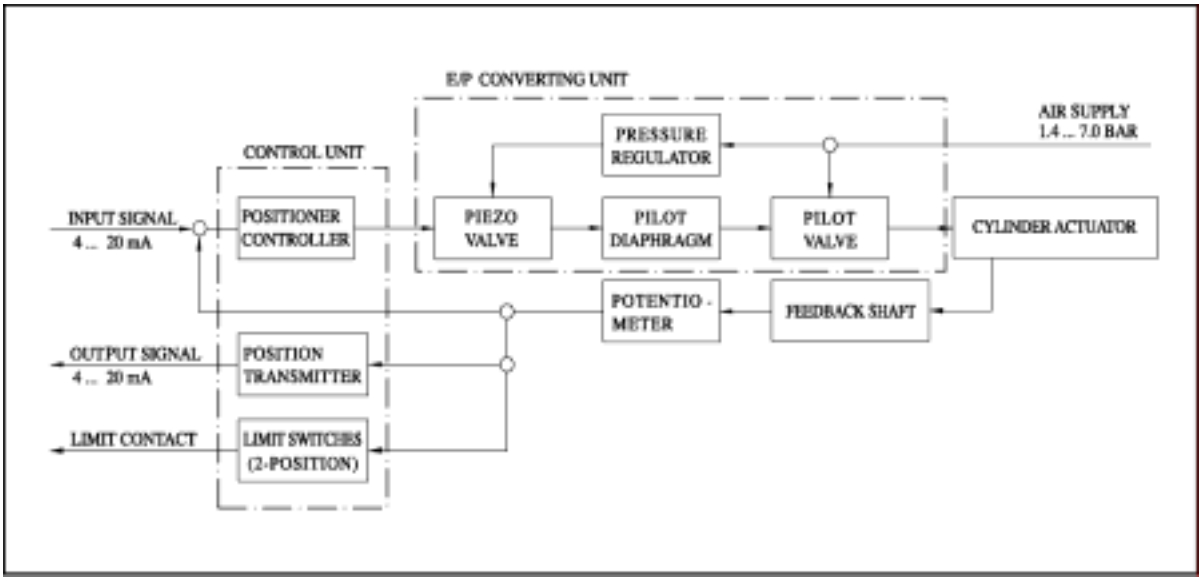
Specifications

Input signal	4~20mA
Split range application	4…12 or 12…20mA
Voltage supply	8VDC…30VDC
Characteristic	Linear
Angle	50…90º (max. up to 100º)
Input pressure range	1.5…7.0 bar
Air consumption	0.08 ㎥/h at 1.5 bar input pressure
Output pressure range	0…100% of supply air pressure
Media characteristic	Pressurized air or allowed gas, Free of oil and dust
Linearity	< 1.0%
Hysteresis	< 0.5%
Sensitivity	< 0.05%
Operating temperature	-20…+80℃(Option -40…+120℃)
Air piping connection	PT 1/4 or NPT 1/4
Conduit connection	PF 1/2 or NPT 1/2
Body material	Aluminum diecast
Protection standard	IP66
Intrinsic safety	Eex ib IIC T6
Weight	1.2 kg (without gauge block)

SP-2310 (rotary dome type)

*** Special Option: Fail in last position upon loss of the input signal**
Please note that it is necessary to contact us if you require this special option

Principle of Operation



1. Input signal (4…20mA) is supplied into the piezo microvalve by passing through the controller in the control unit

2. Supply air (1.4…7.0bar) is supplied into the piezo microvalve by passing through the pressure regulator in the E/P converting unit

3. Due to the piezo-electric effect, the piezo microvalve generates the pneumatic output signal in proportion to the voltage level coming from the controller

4. Pneumatic output signal is amplified by the pilot diaphragm and operates the spool in the pilot valve

5. Supply air (1.4…7.0bar) is supplied into the cylinder actuator by the movement of this spool

6. Position feedback from the feedback shaft goes into the potentiometer

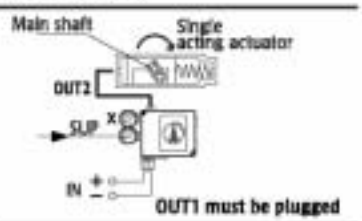
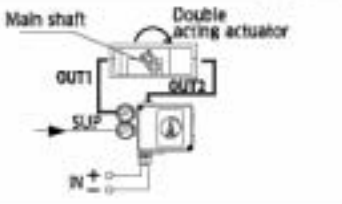
7. Potentiometer generates the feedback signal, which goes into the controller

8. If the feedback signal equals the input signal, the cylinder actuator stops. If not, the controller supplies the piezo microvalve with the input signal until two signals become equal

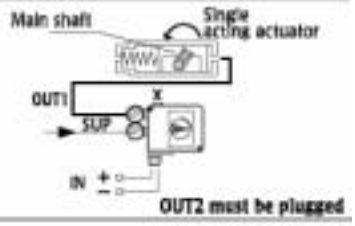
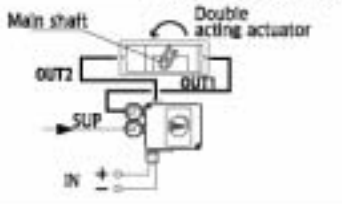
9. As options, the built-in position transmitter generates the output signal (4…20mA) and the built-in limit switches generate the contact signals (open and close) with the feedback signal fed by the potentiometer

Air Connections

Direct Acting(DA)

As the input signal increases, Actuator stem rotates clockwise Switch position : **DA**	
As the input signal increases, Actuator stem rotates clockwise Switch position : **DA**	

Reverse Acting(RA)

As the input signal increases, Actuator stem rotates counter-clockwise Switch position : **RA**	
As the input signal increases, Actuator stem rotates counter-clockwise Switch position : **RA**	

Mounting the Positioner

VALMAC positioner basically has the NAMUR shaft which can be directly mounted to the top pinion (VDI/VDE 3845) of the pneumatic rotary actuator

① Mount the NAMUR bracket to the pneumatic rotary actuator with the enclosed bolts (4 x M5)
② Mount the positioner to the bracket and insert the positioner feedback shaft into the actuator top pinion (output shaft)
③ Fix the positioner to the bracket with the enclosed bolts (4 x M6)
④ Connect all air piping. See page 2 for details

Brackets

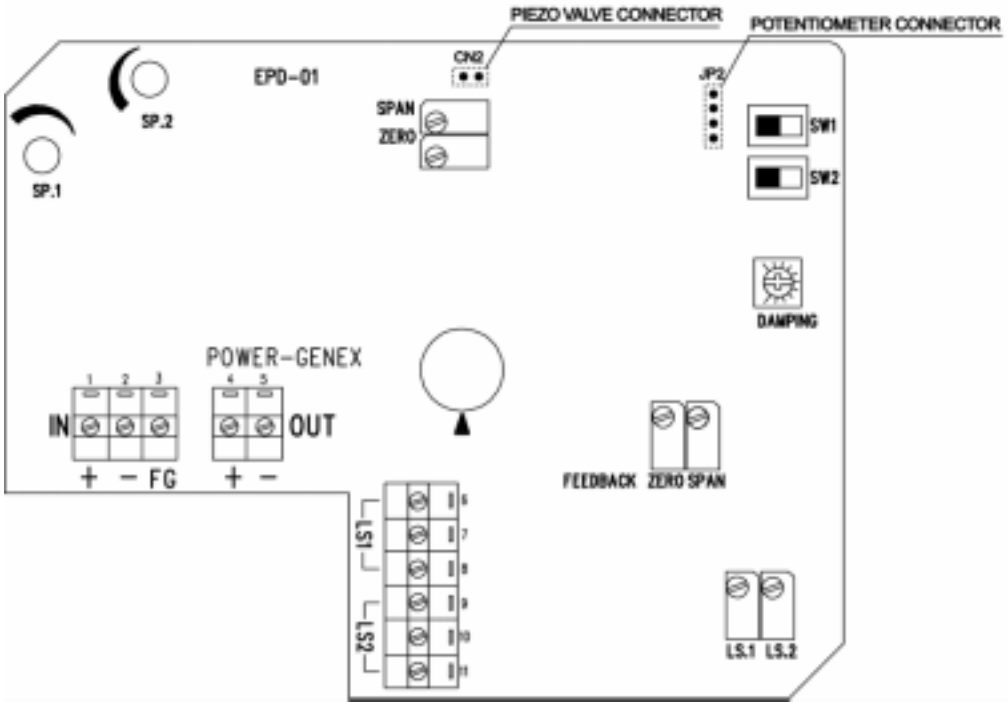

80 x 30 x 20 (H)


80 x 30 x 30 (H)


130 x 30 x 30 (H)

Be sure to install the air filter regulator and set the air pressure required for the actuator before supplying air

Electrical Connections



Before Installing and Setting

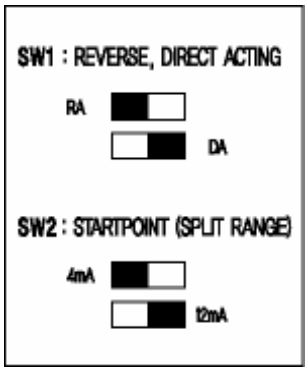
1) Supply air should be the pressurized air or allowed gas. And it is also free of oil and dust

2) When opening the positioner cover at humid places, more attention is required. This may cause the serious malfunction of the control board

3) When connecting wires of the position transmitter and/or limit switches, eliminate the body blind plug and use the enclosed connector (G16)

Selecting Switches

Check all air connections and set switches to meet your requirement before start-up. Please see below



SW 1: Reverse or direct acting

- Left: Reverse acting (RA)
- Right: Direct acting (DA)

SW 2: Start point (spilt range)

- Left: 4…20mA (4mA)
- Right: 12…20mA (12mA)

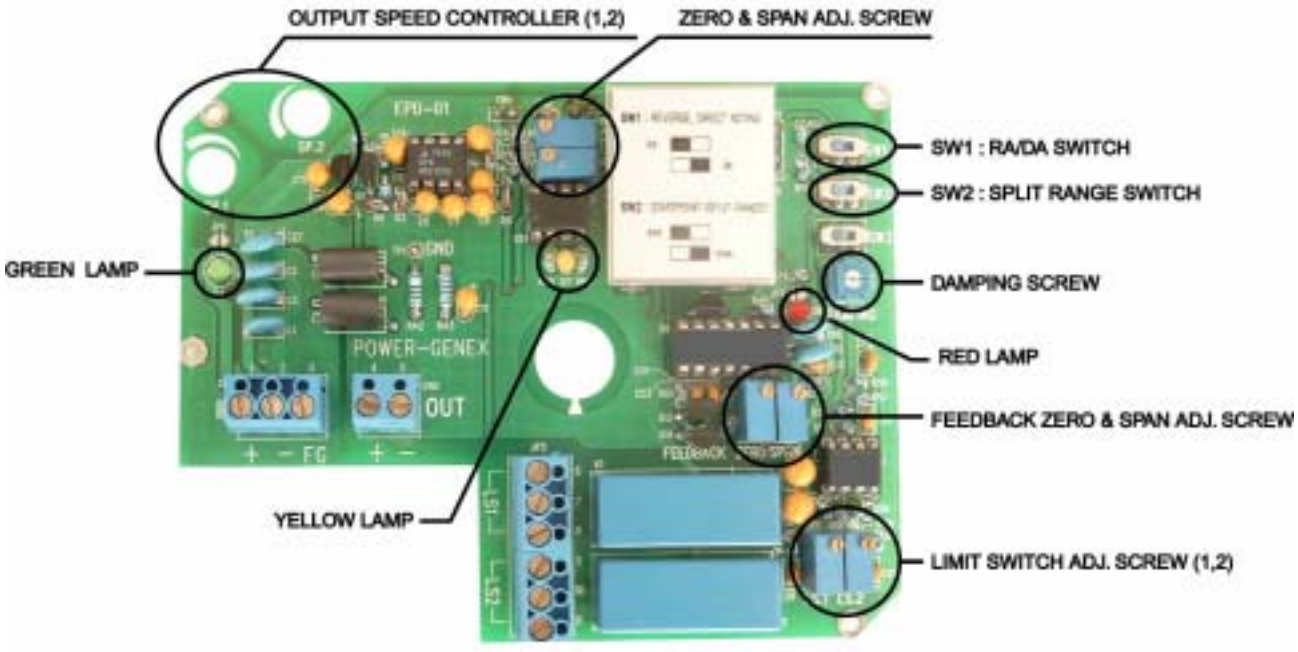
Reverse acting and start point at 4mA are the standard factory settings

Adjusting Span and Zero

When the input signal is set to 4mA, the feedback angle is 0%. And when the input signal is set to 20mA, the feedback angle is 100%

1. **SW 1 should be positioned at RA and the rotation direction of the actuator should be counter clockwise**
2. **If you turn the span and zero adjusting screws clockwise, span and zero will increase. If counter clockwise, they will decrease. Please note that if SW 1: DA is selected, the rotation direction of zero and span is counter clockwise**
3. **If the zero point is exactly set up, you don't have to repeat this adjustment process because, even though the span is re-adjusted, the zero point will not move (fixed)**

Control Board of SP-2200&2300 Positioner



Adjusting Damping Screw

This adjustment is different according to sizes of actuators. Normally it should be set at 50% as right. This is the standard factory setting. But if there is a hunting at a small actuator, turn this screw counter clockwise. If at a big actuator, turn clockwise

Output Speed Controllers (SP1, SP2)

This adjustment is used in order to decrease the control output speed optionally. If you turn clockwise, the output speed will slow down. If counter clockwise, it will become fast

- SP1: to adjust the speed of the output 1
- SP2: to adjust the speed of the output 2

Full speed is the standard factory setting

Lamps

1) Green lamp: This will be on if the input signal is supplied. As the input signal increases, it will become brighter

2) Red lamp: This will be on if the feedback is connected. As the feedback signal increases, it will become brighter. Please note that this will be on once the feedback signal is loaded on the power (15…30VDC)

3) Yellow lamp: This is always dim-lighted. But in case that there is an error on the control board or the board is contaminated by dirt, it will become brighter. After cleaning this board with air, check the connected parts on the board

Position Transmitter

Output signal	4…20mA
Power supply rating	15…30VDC
Recommended power supply	24VDC
Operating temperature	-20…+70℃
Lode impedance	0…600 Ω
Characteristic	Linear
Linearity	±0.5% F.S.
Hysteresis	±0.5% F.S.
Repeatability	±0.5% F.S.
Adjustment	Zero and span
Rotary angle	50…90º (max. 100º)

1) Check the electrical connections correctly. See page 3 for details
2) Set the input signal to 4mA, confirm the output signal, and fix the zero screw at 4mA
3) Set the input signal to 20mA, confirm the output signal, and fix the span screw at 20mA. Please keep it in mind that you don't have to repeat this adjustment process because the zero point is fixed, even though the span is moved.
4) Check the input signal and the output signal once again one by one as follows

- Input signal: 4 → 8 → 12 → 16 → 20mA
- Output signal: 4 → 8 → 12 → 16 → 20mA

Be sure to set the positioner properly in order to get the correct outputs

Limit Switches (LS1, LS2)

Rated power	Max. 1W
Switching voltage	Max. 100VDC
Switching current	Max. 0.01A
Carry current	0.5A
Breakdown voltage	Min. 150VDC
Operating temperature	-20…+70℃
Isolation coil / contact	Min. 4.0KVDC
Insulation coil / contact	Min. 10^{10} Ω

1) Check the electrical connections. See page 3 for details
2) Select No or Nc, turn LS1 or LS2 screw, and set the contact point

Troubleshooting Tips

Problem	Solution
Green lamp is off	→ Check the input signal connections. See page 3
Red lamp is off	→ Check the output signal connections. See page 3 → Check whether the power (15…30VDC) is supplied or not
Yellow lamp is bright	→ Check the connection of JP2 with potentiometer. See page 3 → Check whether the control board is contaminated by dirt and water
Actuator is suffering from the hunting	→ Eliminate the hunting by turning the damping screw counter clockwise at 50% position → Check whether the positioner feedback shaft is exactly inserted into the actuator top pinion (output shaft)
The response speed of the actuator is too fast	→ Adjust the speed by turning the output speed controller (SP1, SP2)

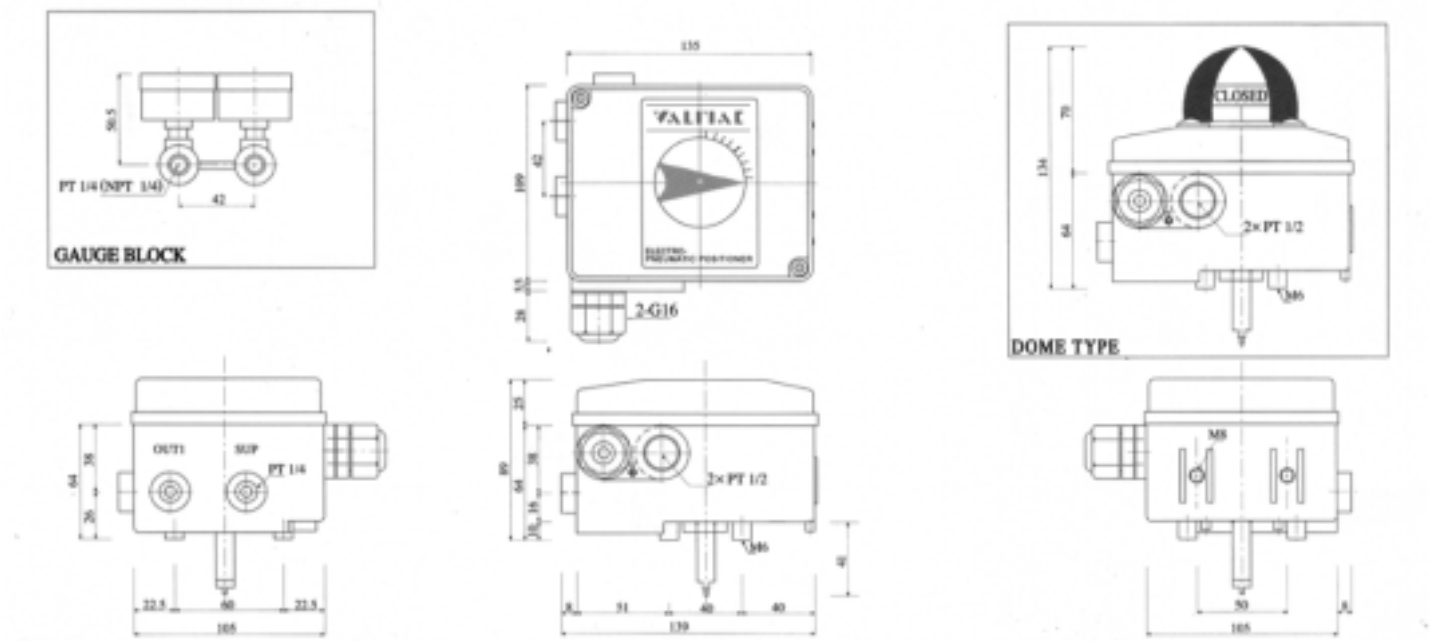
Order Information

SP-	-	Actuator Operation	–	Feedback Lever Type	Pressure Gauge Block	Position Feedback	Indicator Type	Mounting Bracket

Description	Order Code
Actuator Operation:	
- Linear type	2200
- Rotary type	2300
Feedback Lever:	
- Linear type	A: stroke (5…65mm) B: stroke (10…85mm) C: stroke (up to 150mm)
- Rotary type	A: NAMUR shaft
Pressure Gauge Block:	N: none 1: 6 bar (90psi) 2: 10 bar (150psi)

Description	Order Code
Position Feedback:	N: none O: position transmitter (output signal 4…20mA) L: 2-limit switches M: O+L
Indicator Type: **(Only for SP-2300)**	F: flat type (standard) D: dome type
Mounting Bracket: **(Only for SP-2300)**	N: none 1: 80 ×30 ×20 (H) 2: 80 ×30 ×30 (H) 3. 130 ×30 ×30 (H)

Dimensions



SEO JEON VALMAC Co., Ltd.

691, ORYU-DONG
SEO-GU. INCHEN. KOREA

Tel: +82-32-565-3121
Fax: +82-32-565-3124
E-mail: valmac@valmac.co.kr
Website: http://www.valmac.co.kr