AP9037

POWER GENEX SS2R ATEX EXIA SMART POSITIONER

Key features:

- Electro-pneumatic Smart positioner
- Die-cast aluminium powder painted body
- IP66 rated enclosure
- Low air consumption
- Max. supply pressure: 7.0 bar (100 psi)
- 4-20mA input
- HART communication
- Limit switches
- Ambient temperature: -30°C to +80°C
- ATEX EXIA IIC T5

DETAILS

The Power Genex ATEX EXIA SS2R Electro Pneumatic Smart Positioner provides accurate valve positioning for spring return and double acting actuators.

The positioner features an IP66 rated, die-cast aluminium powder coated enclosure and conforms to Namur VDI/VDE 3845 standards for easy mounting.

Pneumatic connections are ¼ " BSP rated for a maximum supply pressure of 7.0 bar (100 psi).

The electrical connections are M20 x 1.5 for a control input signal between 4mA to 20mA.

The positioner features HART Communication, limit switches and a 4mA to 20mA position transmitter.

Easy and quick auto-calibration.

For full technical specifications, connections details, and setup information please refer to the appendix.

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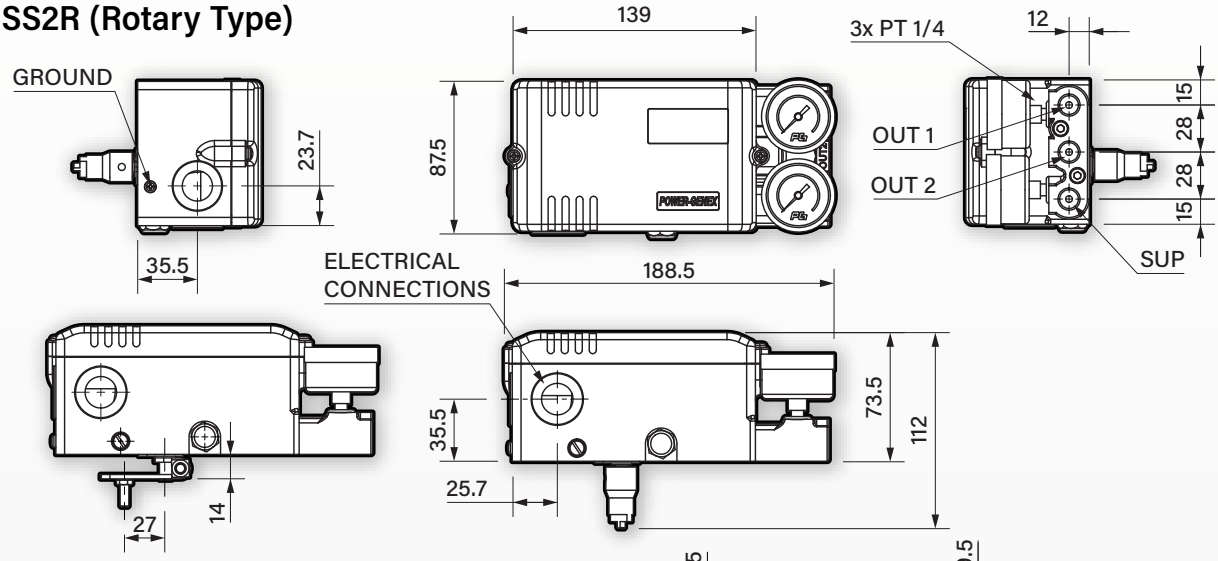
POWER GENEX SS2R ATEX EXIA

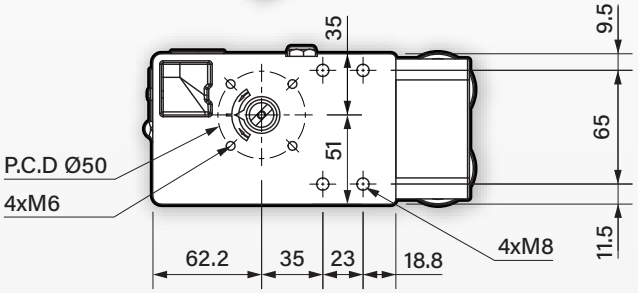
SMART POSITIONER

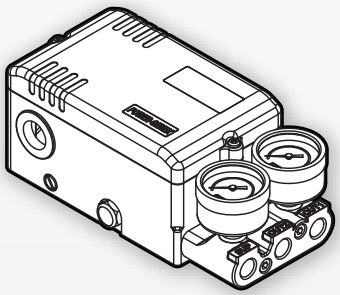
DIMENSIONS IN MM

SS2R (Rotary Type)



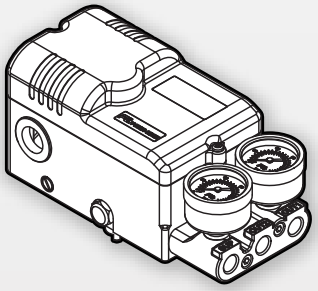
Fork Lever Type

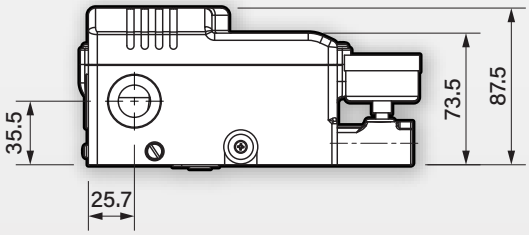




With Gauge Block

SS2 With 2x SPDT Micro S/W





AP9037

POWER GENEX SS2R ATEX EXIA

SMART POSITIONER

FRONT COVER REMOVED

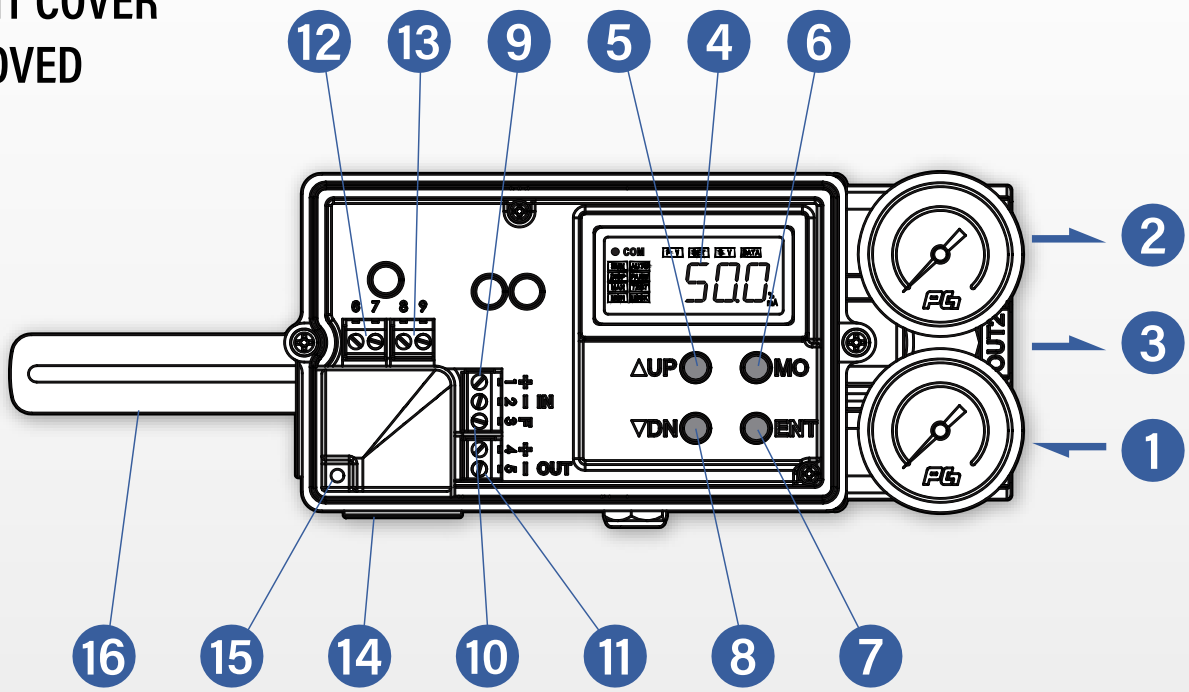


TABLE 1: LEGEND

Item	Description
1	Air supply
2	OUT 1
3	OUT 2
4	Display LCD
5	Up key
6	Mode key
7	Enter key
8	Down key
9	Input signal (+,-)
10	Frame ground
11	Output signal (+,-)
12	Alarm limit 1
13	Alarm limit 2
14	Electrical connections
15	Ground
16	Feedback lever

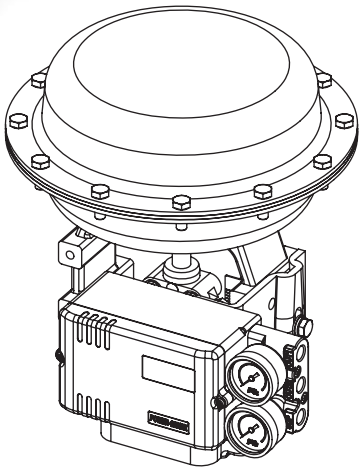
Smart performance with innovative and ever-strong coil drive even under harsh working environments

Features

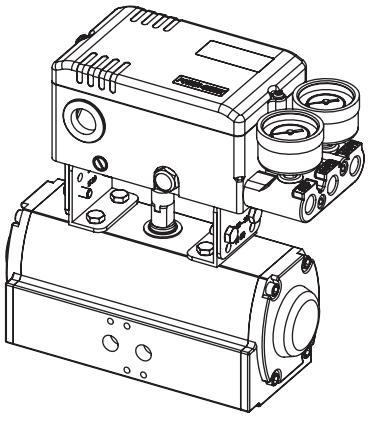
- Easy and quick auto-calibration
- Detecting RA (reverse acting) or DA (direct acting) automatically regardless of wrong air connections
- Available to use for single or double acting without any special adjustments
- Compact design allowing to be installed on small actuators
- Providing error messages against performance failures
- Possible to test the actuator with any fixed signal under a test mode
- Programmable characteristic curve with 17 points
- Wide operating temperature range -30 ~ +80℃
- Improved control of high-friction globe and ball valves by eliminating an overshoot and a hunting
- Low air consumption
- Providing a mounting bracket to meet IEC 60534-6-1 for linear valves
- Supporting a NAMUR mounting pattern VDI/VDE 3845 (IEC 60534-6-2) and providing a multi-size mounting bracket for rotary valves

Options

- Output position transmitter (4 - 20 mA)
- 2 x alarm limit or micro switch (SPDT)
- Low temperature (- 40℃)
- Intrinsically safe type (IECEx / ATEX / TR-CU / KC Ex ia IIC T6/T5)
- HART communication
- Profibus PA communication
- Foundation Fieldbus communication



- SS2L (Linear Type)



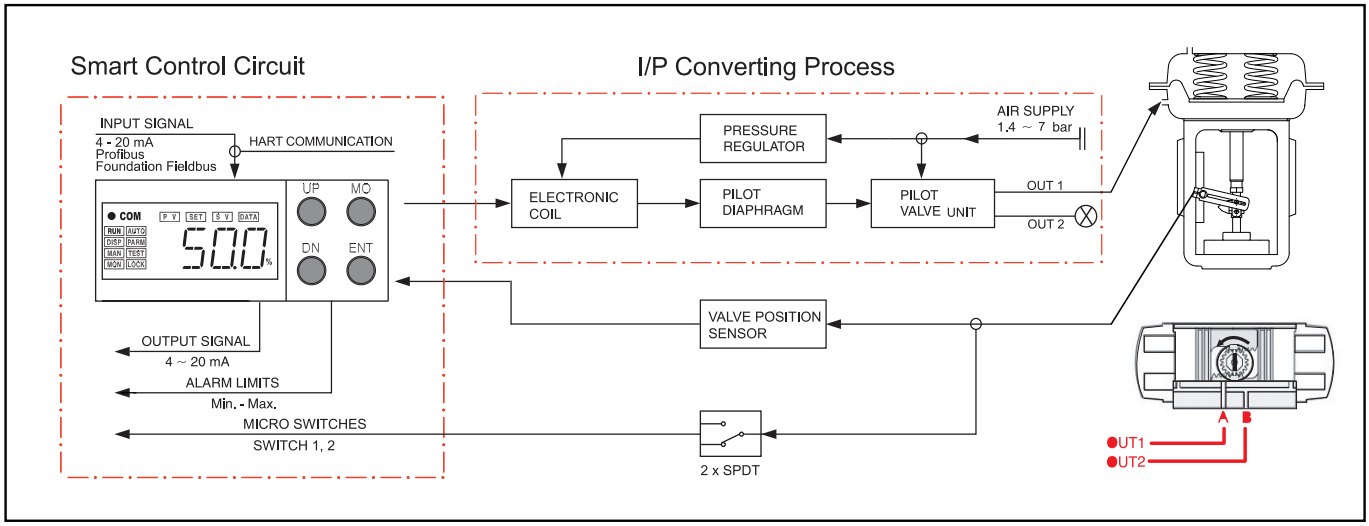
- SS2R (Rotary Type)

Specifications

Communication	Without	HART	Profibus - PA	Foundation Fieldbus
Input Signal / Bus voltage	4 - 20 mA @ 24 VDC		9 - 32 VDC	
Min. / Max. Current	3.6 mA / 50 mA		-	
Current Consumption	-		15mA	16mA
Voltage Drop (Resistance)	8.7 VDC(435Ω)	9.4 VDC(470Ω)	-	
Stroke / Angle	Linear type : 5 - 130 mm * Rotary type : 25 - 120°			
Air Supply Pressure	1.4 - 7.0 bar (20 - 100 psi), filtered, compressed dry and non-oiled to meet Class 3 of ISO 8573-1			
Output Pressure Range	0 - 100% of supply air pressure			
Air Capacity	80 ℓ/min = 4.8 N㎥/h = 2.8 scfm (Sup = 1.4 bar) 233 ℓ/min = 14 N㎥/h = 8.2 scfm (Sup = 6 bar)			
Air Consumption	2.8 ℓ/min = 0.17 N㎥/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		
Performance Characteristic	Linear, EQ %, Quick open, User set (17 points)			
LCD Indication	4-digit LCD indicator			
Adjustable Speed	1 - 1000 (lowest 1, highest 1000)			
Scan Time	2ms			
Shut-off Value	Range 0 - 10% of position signal			
Valve Action	direct action (DA) / reverse action (RA)			
Operating Temper ture	- 30 ~ +80℃ (- 22 ~ +176 °F) **			
Pneumatic Connections	PT(Rc) 1/4 or NPT 1/4			
Electrical Connections	2 x PF(G) 1/2 , NPT 1/2 , M20 x 1.5			
Protection Class	IP66, Intrinsically safe (IECEx / ATEX / KC Ex ia IIC T6/T5)			
Body Material	Aluminum die-cast / powder-painted			
Weight	1.6 kg			

* Up to 200mm on request ** -40℃ on request

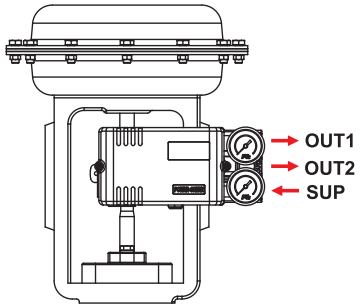
Principle of Operation



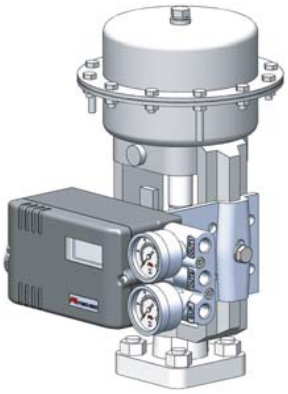
If 4-20 mA input signal(or Bus communication signal) is supplied, the micro processor compares input signal with position feedback and sends control signal to the I/P converting module. Pneumatic signal from the I/P converting module operates the valve and the valve stays at the desired position.

Mounting to Linear Actuator

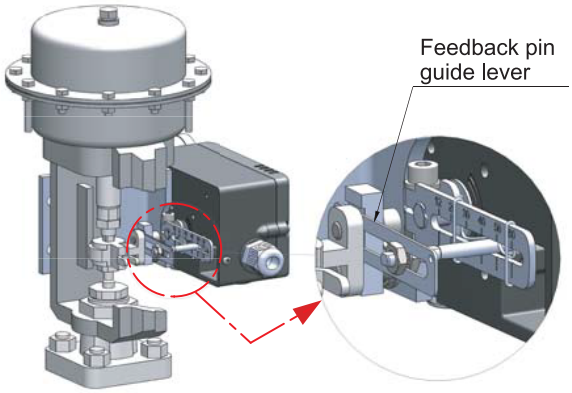
- SS2L (Linear Type)



< Front View >

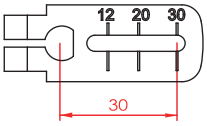


< Side View >

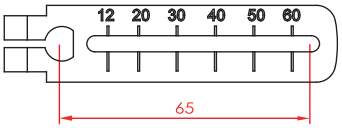


< Feedback Lever Connection >

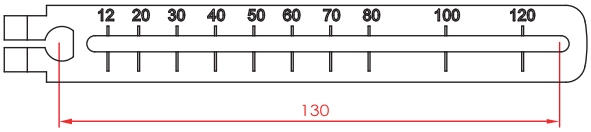
"A" Type



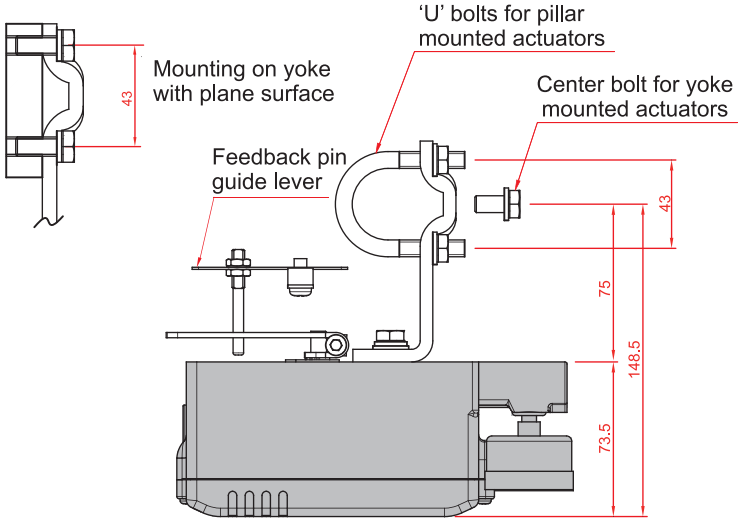
"B" Type



"C" Type



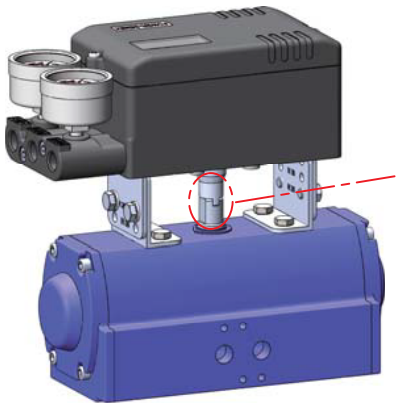
Feedback Lever

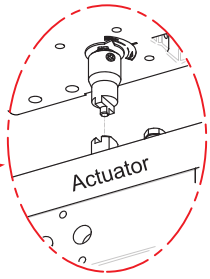


Mounting to linear actuators to IEC 60534 6-1

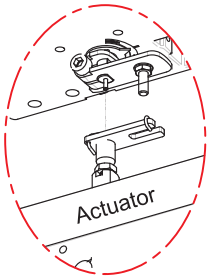
Mounting to Rotary Actuator

- SS2R (Rotary Type)

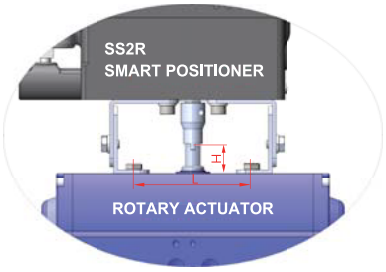




NAMUR Type Mounting (VDI/VDE 3845, IEC 60534-6-2)



Fork Lever Type Mounting



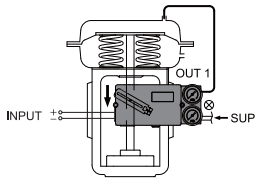
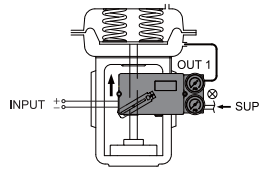
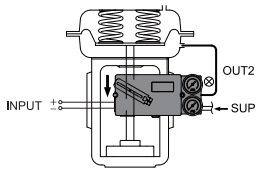
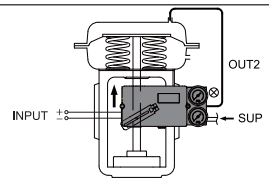
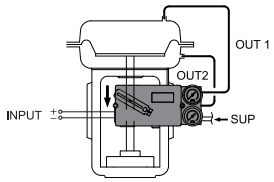
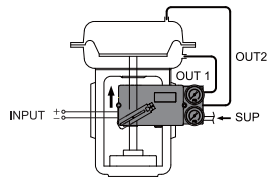
Size Variation of Multi-Size Bracket

1) 80 x 30 x 20 (H) , 4) 130 x 30 x 20 (H)
2) 80 x 30 x 30 (H) , 5) 130 x 30 x 30 (H)
3) 80 x 30 x 50 (H) , 6) 130 x 30 x 50 (H)

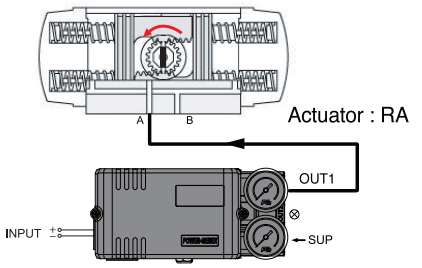
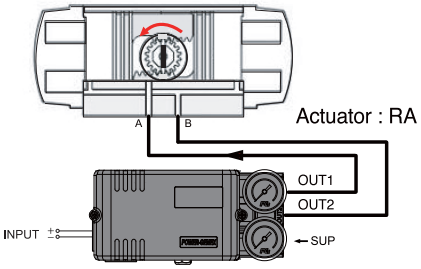
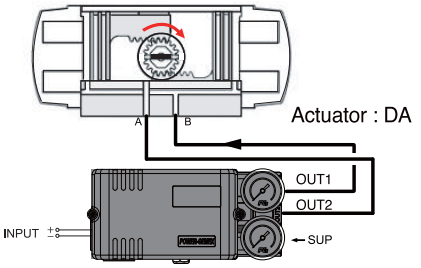
H : Rotary Actuator Shaft Height
L : Length (80 or 130mm)

Air Connections

- SS2L (Linear Type)

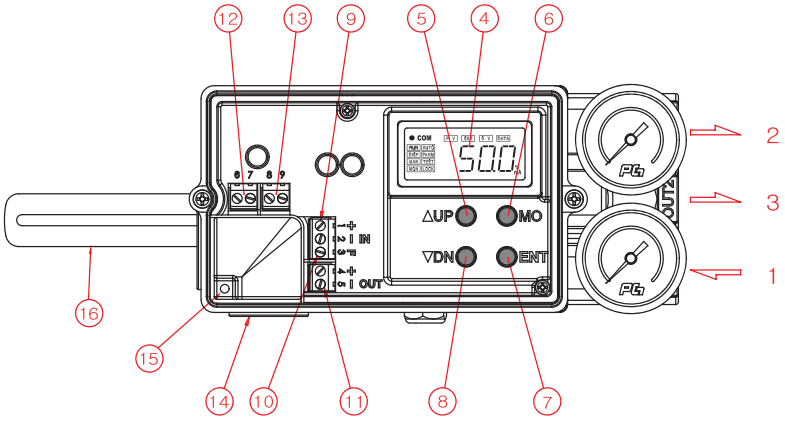
Direct Acting (DA)		Reverse Acting (RA)	
DA 1 As the input signal increases, Valve stem moves downwards Actuator : DA	 OUT2 must be plugged	**RA 1** As the input signal increases, Valve stem moves upwards Actuator : RA	 OUT2 must be plugged
DA 2 As the input signal increases, Valve stem moves downwards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

- 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

SS2 Front Cover Removed



1 : Air supply
2 : OUT 1
3 : OUT 2
4 : Display LCD
5 : Up key
6 : Mode key
7 : Enter key
8 : Down key
9 : Input signal (+, -)
10 : Frame ground
11 : Output signal (+, -)
12 : Alarm limit 1
13 : Alarm limit 2
14 : Electrical connections
15 : Ground
16 : Feedback lever

Electrical Connections

1 (+)
2 (−) — IN. 4-20mA input signal

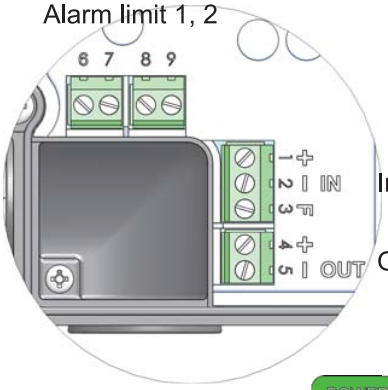
3 (FG) — Frame Ground

4 (+)
5 (−) — OUT. 4-20mA output signal

6 (+)
7 (−) — LS1. (Low) Alarm limit 1

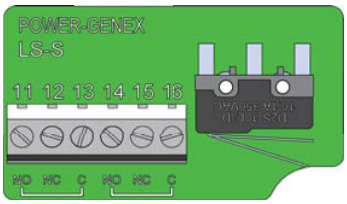
8 (+)
9 (−) — LS2.(High) Alarm limit 2

Alarm limit 1, 2



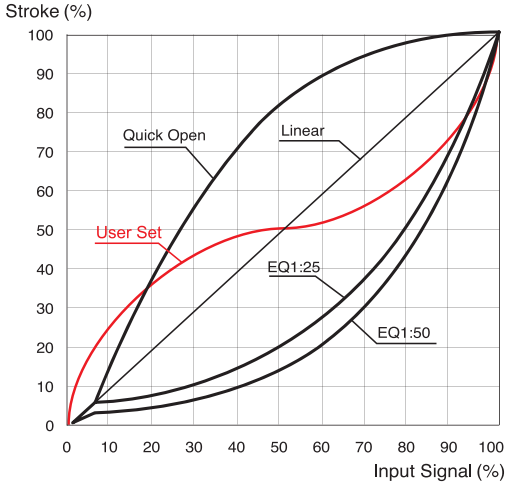
Input signal

Output signal



Micro switches 1, 2

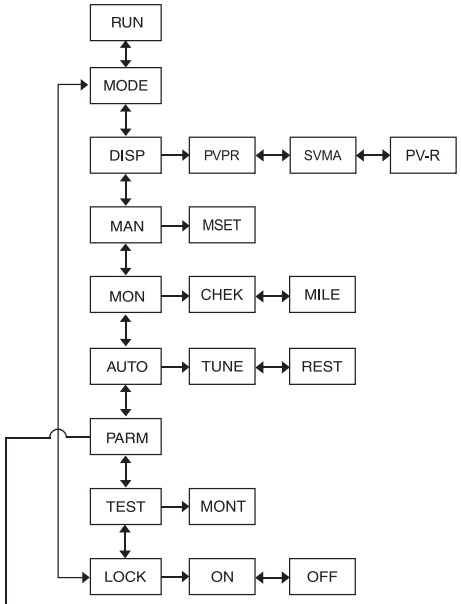
Characteristic Curves



Quick Start and Checking

	Button	Action
Auto - Calibration	MO	Push 5 seconds for auto-calibration
Span	▽DN → ENT ▽DN or ΔUP ENT → MO	Push ▽DN 5 seconds to change a measured span (Try this option only when a valve doesn't reach a desired position)
Ambient Temp.	ENT	Confirm an ambient temperature surrounding this smart valve positioner

Parameters Diagram



: Shows the operating situation of the positioner

: Changes the parameters

: Decides LCD display mode in mA, % or a reverse way

: Converts to the manual mode

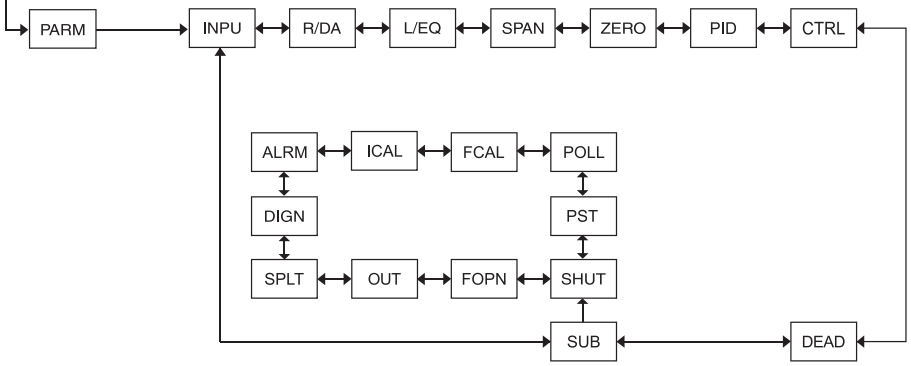
: Shows the selected parameters and a total valve runtime

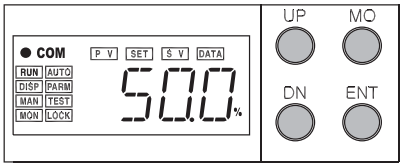
: Performs auto-calibration and resets all programmed values

: Main parameters

: Mounting test mode

: Locks the set values



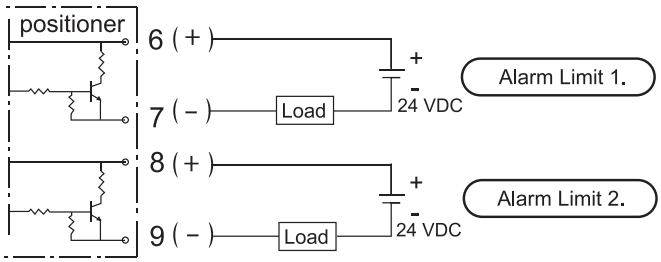


LCD Display

● COM : Hart Communication

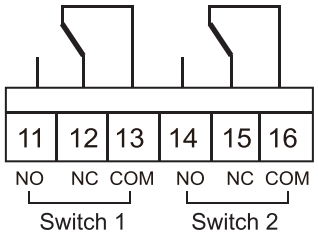
Parameter	Description	Function	Default
INPU	Input signal	4 ~ 20mA or 20 ~ 4mA	4 ~ 20mA
R/DA	RA/DA	Reverse acting or direct acting	Auto-set
L/EQ	Characteristic	Linear, E.Q.%(1:25 or 1:50), Quick open or User set(17points)	Linear
SPAN	Span adjustment	0 ~ 100%	100%
ZERO	Zero adjustment	0 ~ 99%	0%
PID	P-GN / I-GN / D-GN	Proportional / Integral / Differential gain value	Auto-set
SPED	Response speed	1 ~ 1000	1000
SWST	Slow start	Smooth operation (ON or OFF)	Auto-set
CNLT	Control limit	50 ~ 1250	Auto-set
GCNL	Gap control limit	50 ~ 1250	Auto-set
DEAD	Dead band	0 ~ 9.99%	0.5%
HDGP	D-gain setting for hard mode	D-Gain setting for hard mode	Auto-set
SHUT	Shut-off	0 ~ 9.9%	0.3%
FOPN	Full-open	0 ~ 9.9%	0.3%
OUT	Output signal	4 ~ 20mA or 20 ~ 4mA	4 ~ 20mA
SPLT	Split range	4 ~ 12mA or 12 ~ 20mA	4 ~ 20mA
DIGN	Display place	Movement to one or two decimal places	1
ALAM	Alarm limit low, high	AL1L / AL1H / AL2L / AL2H	0 ~ 10%, 90 ~ 105%
ICAL	IN4M / IN20	Internal match with 4~20mA input signals from a calibrator	Factory setting
FCAL	FB4M / FB20	Internal match with 4~20mA output signals to a calibrator	Factory setting
POLL	Polling address	HART Communication polling address (0 ~ 15)	0
PST	Partial stroke test	Checks a valve status	OFF

Wiring Alarm Limits



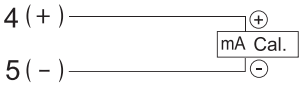
Note that 24 VDC should be supplied for power.

Micro Switches (SPDT)

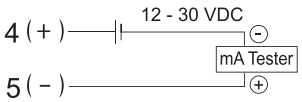


Measuring Output Signal

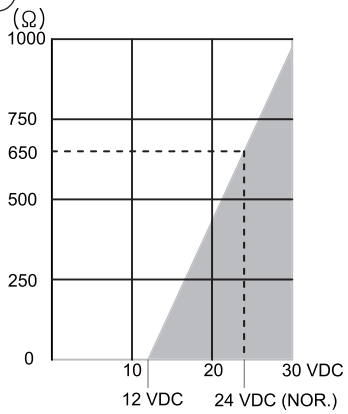
① With mA loop calibrator



② With mulitimeter (mA)



ZERO and SPAN of position feedback are automatically set after auto-calibration process.



< Transmitter Load Limitation >

Micro Switches	
Type	SPDT
Rating	10.1A @ 250 VAC
Ambient Temperature	-30 ~ +85℃
Position Transmitter	
Output Signal	4 - 20 mA, 2-wire
Power Supply	12 - 30 VDC
Output Current Limit	30 mA DC
Linearity	1% F.S
Operating Temperature	-40 ~ +80℃

How to Order

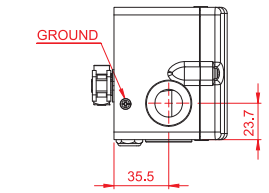
SS2 — Actuator Operation — Protection Class — Feedback Lever — Pressure Gauges — By-pass — Position Feedback — Communication — Connection Threads — Mounting Bracket — Feedback Pin Guide Lever Set

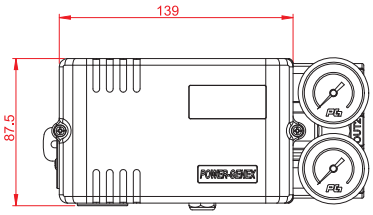
Description	Code
Actuator Operation :	L : Linear type R : Rotary type
Protection Class :	I : Intrinsically safe IECEx / ATEX / TR-CU Ex ia IIC T6/T5 K : Intrinsically safe KC - Ex ia IIC T6/T5 W : Weatherproof to IP66
Feedback Lever :	
- Linear type :	A : Stroke (5~30mm) B : Stroke (5~65mm) C : Stroke (5~130mm) D : Stroke (80~200mm)
- Rotary type :	F : Fork lever N : NAMUR shaft (direct mounting)
Gauge Block :	0 : Not mounted 1 : 6 bar (90 psi) 2 : 10 bar (150 psi)
By-pass :	N : None (standard) Y : Yes (auto/manual screw)

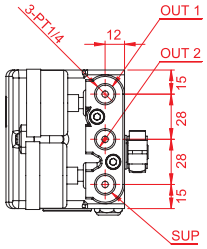
Description	Code
Position Feedback :	N : None O : Position transmitter (4~20mA output signal) L : 2 x alarm limit S : 2 x micro switch (SPDT) M : O + L Q : O + S
Communication : (only for weatherproof type)	N : None H : HART P : Profibus PA F : Foundation Fieldbus
Connection Threads : (pneumatic - electrical)	3 : PT(Rc) 1/4 - PF(G) 1/2 4 : NPT 1/4 - NPT 1/2 5 : PT(Rc) 1/4 - M20 x 1.5
Mounting Bracket :	N : None L : IEC 60534-6-1 (for SS2L) R : IEC 60534-6-2 (for SS2R) VDI/VDE 3845
Feedback Pin Guide Lever Set : (only for linear type SS2L)	0 : Not included 1 : Included

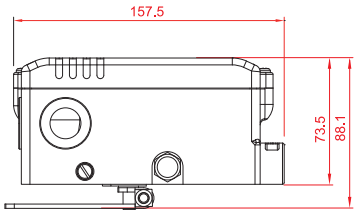
Dimensions

- SS2L (Linear Type)

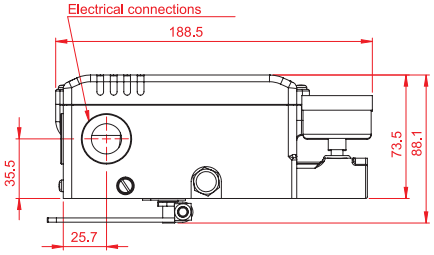


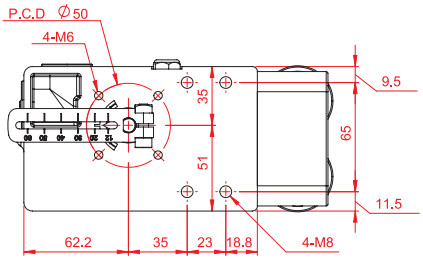


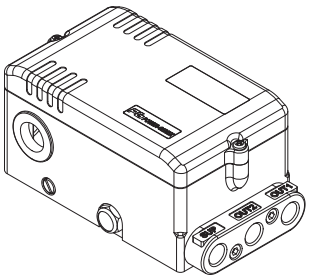




< Without Gauge Block >

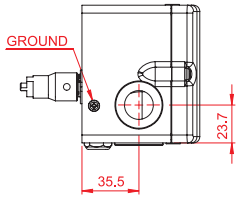


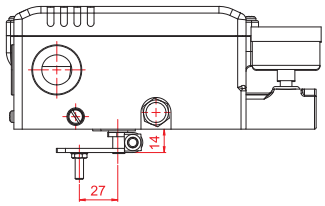




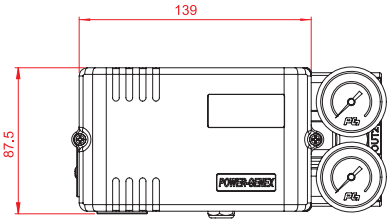
Without Gauge Block

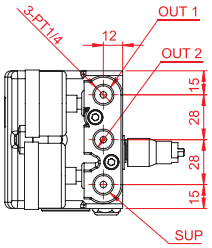
- SS2R (Rotary Type)

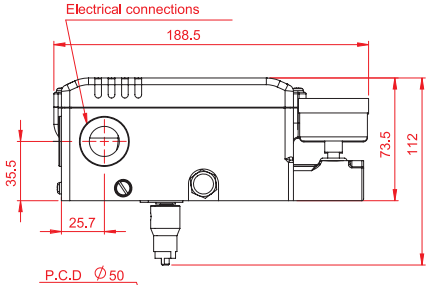


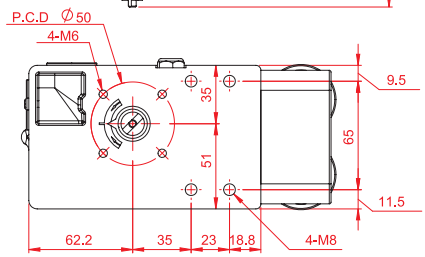


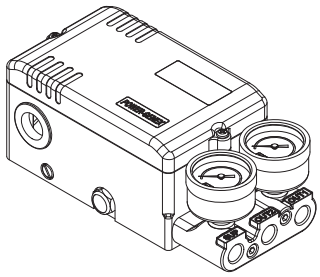
< Fork Lever Type >





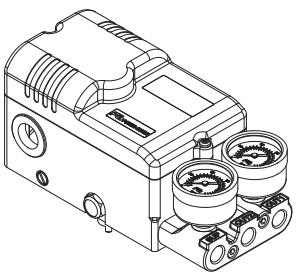


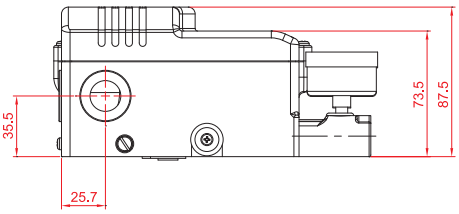




With Gauge Block

- SS2 with 2 x SPDT Micro S/W





< SS2SL & SS2SR >

Specifications

Communication	Without	HART	Profibus-PA	Fieldbus
Input Signal	4 - 20 mA @ 24 VDC		9 - 32 VDC	
Min. / Max. Current	3.6 mA / 50 mA		-	
Current Consumption	-		15mA	16mA
Voltage Drop (Resistance)	8.7 VDC(435Ω)	9.4 VDC(470Ω)		
Stroke / Angle	Linear type : 5 - 130 mm * Rotary type : 25 - 120°			
Air Supply Pressure	1.4 - 7.0 bar (20 - 100 psi)			
Output Pressure Range	0 - 100% of supply air pressure			
Air Capacity	80 ℓ/min = 4.8 N㎥/h = 2.8 scfm (Sup = 1.4 bar) 233 ℓ/min = 14 N㎥/h = 8.2 scfm (Sup = 6 bar)			
Air Consumption	2.8 ℓ/min = 0.17 N㎥/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	
Performance Characteristic	Linear, EQ %, Quick open, User set (17 points)			
LCD Indication	4-digit LCD indicator			
Adjustable Speed	1 - 1000 (lowest 1, highest 1000)			
Scan Time	2ms			
Shut-off Value	Range 0 - 10% of position signal			
Valve Action	Direct action(DA) / Reverse action(RA)			
Operating Temperature	- 30 ~ +80℃ (- 22 ~ +176 °F) **			
Pneumatic Connections	NPT 1/4 (other on request)			
Electrical Connections	NPT 1/2 (other on request)			
Protection Class	IP66, Intrinsically safe (IECEx / ATEX / KC Exia IIC T6/T5)			
Body Material	Stainless steel 316			
Weight	3.8 kg (without bracket)			

* Up to 200mm on request ** -40℃ on request

How to Order

SS2S — Actuator Operation — Protection Class — Feedback Lever — Pressure Gauges — By-pass — Position Feedback — Communication — Connection Threads — Mounting Bracket — Feedback Pin Guide Lever Set

Description	Code
Actuator Operation :	L : Linear type R : Rotary type
Protection Class :	I : Intrinsically safe IECEx / ATEX / TR-CU Ex ia IIC T6/T5 K : Intrinsically safe KC - Ex ia IIC T6/T5 W : Weatherproof to IP66
Feedback Lever :	
- Linear type :	A : Stroke (5~30mm) B : Stroke (5~65mm) C : Stroke (5~130mm) D : Stroke (80~200mm)
- Rotary type :	F : Fork lever N : NAMUR shaft (direct mounting)
Gauge Block :	0 : Not mounted 1 : 6 bar (90 psi) 2 : 10 bar (150 psi)
By-pass :	N : None Y : Yes (auto/manual screw)

Description	Code
Position Feedback :	N : None O : Position transmitter (4~20mA output signal) L : 2 x alarm limit S : 2 x micro switch (SPDT) M : O + L Q : O + S
Communication : (only for weatherproof type)	N : None H : HART P : Profibus PA F : Fieldbus Foundation
Connection Threads : (pneumatic - electrical)	4 : NPT 1/4 - NPT 1/2
Mounting Bracket :	N : None L : IEC 60534-6-1 (for SS2SL) R : IEC 60534-6-2 (for SS2SR) VDI/VDE 3845
Feedback Pin Guide Lever Set : (only for linear type SS2SL)	0 : Not included 1 : Included