

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

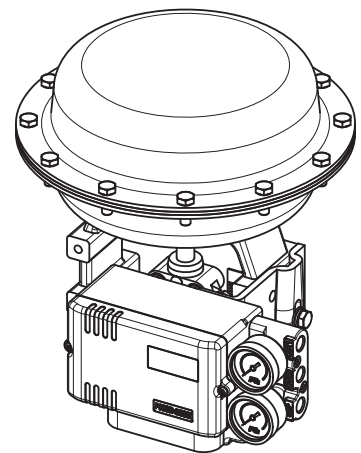


Features

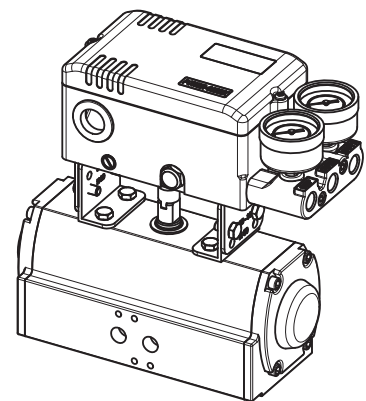
- ▶ Easy and quick auto-calibration
- ▶ Detecting RA (reverse acting) or DA (direct acting) automatically regardless of wrong air connections
- ▶ Available to use for single or double acting without any special adjustments
- ▶ Compact design allowing to be installed on small actuators
- ▶ Providing error 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 °C
- ▶ 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)
- ▶ Explosion proof type (IECEx / ATEX / KC Ex ia IIC T5)
- ▶ HART communication
- ▶ Profibus communication (in progress)
- ▶ Fieldbus Foundation communication (in progress)



- SS2L (Linear Type)



- SS2R (Rotary Type)

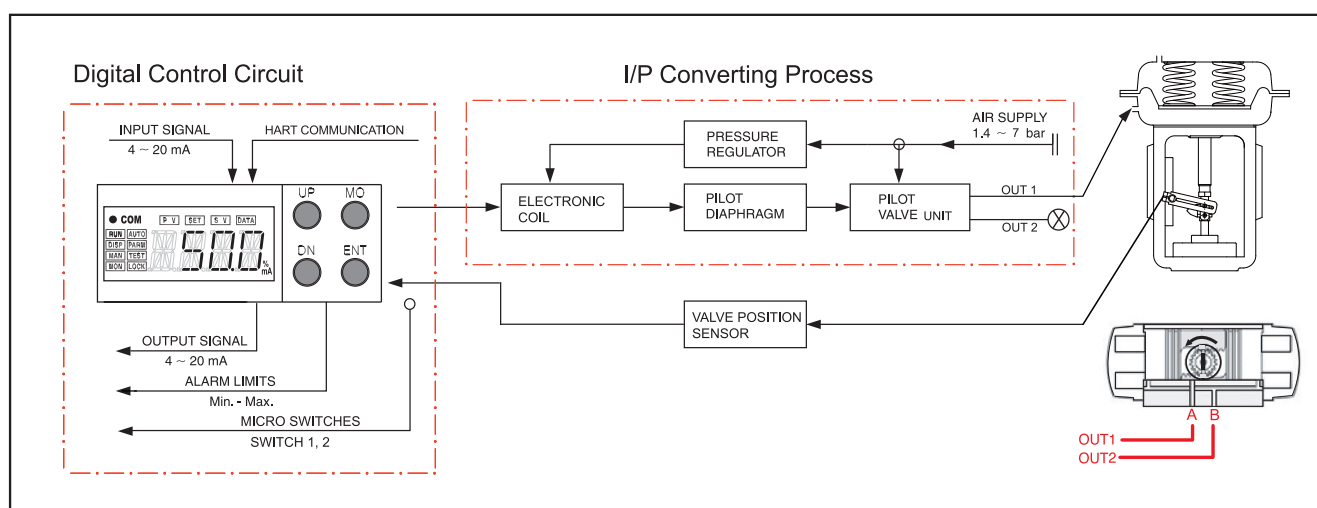
Specifications

Input Signal	4 - 20 mA @ 24 VDC
Min. / Max. Current	3.6 mA / 50 mA
Voltage Drop (Resistance)	Without Hart : 8.7 VDC (435Ω @ 20 mA) With Hart : 9.4 VDC (470Ω @ 20 mA)
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 ^m /h = 2.8 scfm (Sup = 1.4 bar) 233 l/min = 14 N ^m /h = 8.2 scfm (Sup = 6 bar)
Air Consumption	2 l/min = 0.12 N ^m /h = 0.07 scfm (Sup = 1.4 ~ 6 bar)
Characteristic	Linearity < ±0.3% F.S Sensitivity < 0.2% F.S Hysteresis < 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 °C (- 22 ~ +176 °F) **
Pneumatic Connections	PT(Rc) 1/4 or NPT 1/4
Electrical Connections	2 x PF(G) 1/2 or NPT 1/2
Protection Class	IP66, intrinsically safe (IECEX / ATEX / KC Exia IIC T5)
Body Material	Aluminum die-cast / powder-painted
Weight	1.6 kg

* Up to 200mm on request

** -40 °C on request

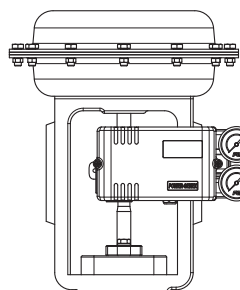
Principle of Operation



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.

Mounting to Linear Actuator

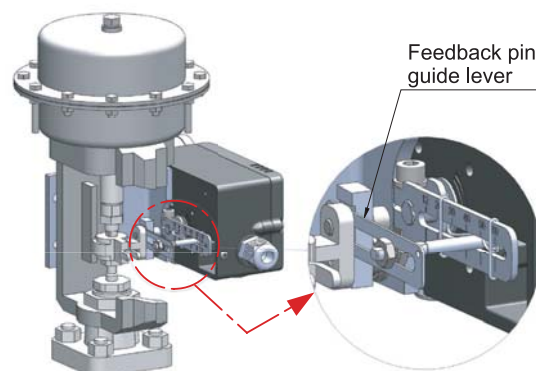
- SS2L (Linear Type)



< Front View >

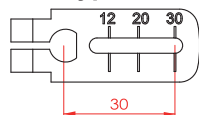


< Side View >

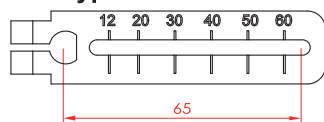


< Feedback Lever Connection >

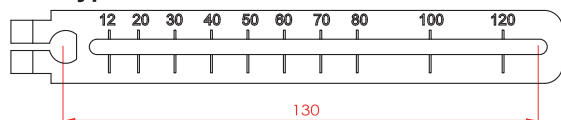
"A" Type



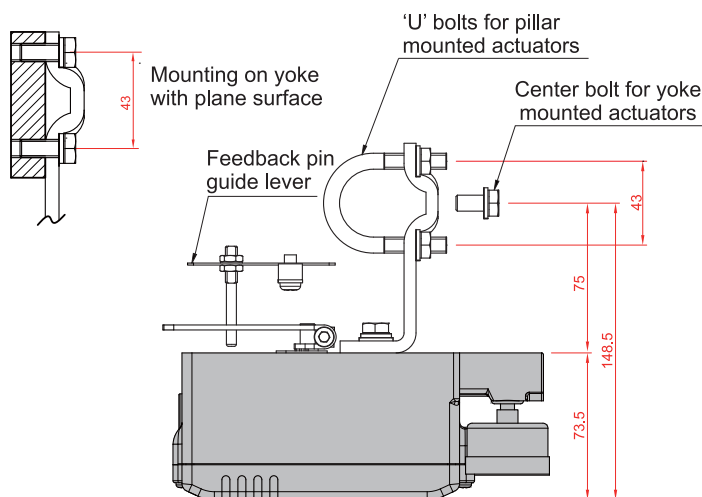
"B" Type



"C" Type



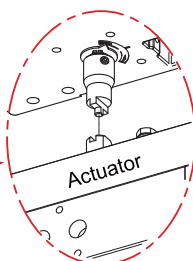
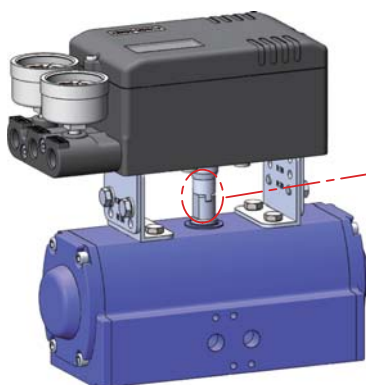
Feedback Lever



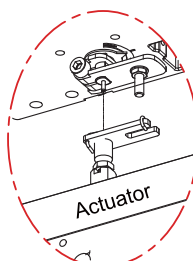
Mounting to linear actuators to IEC 60534 6-1

Mounting to Rotary Actuator

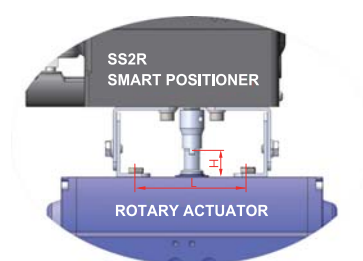
- SS2R (Rotary Type)



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



Fork Lever Type Mounting



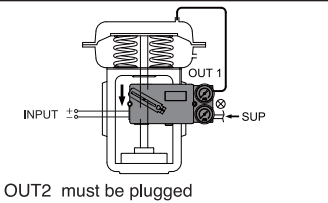
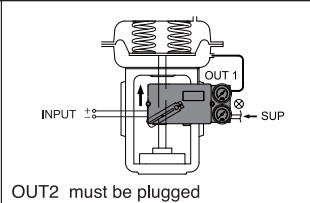
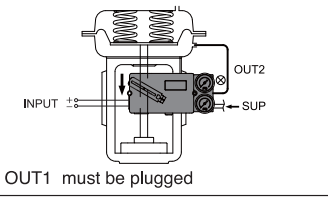
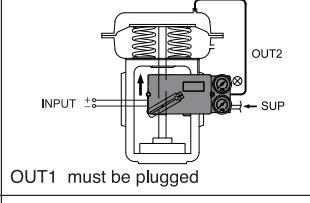
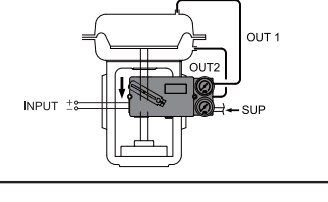
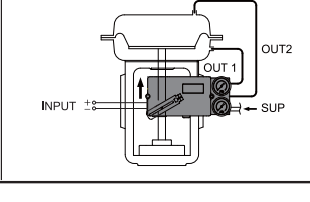
Size Variation of Multi-Size Bracket

- 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)

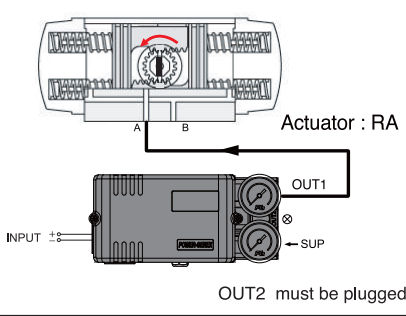
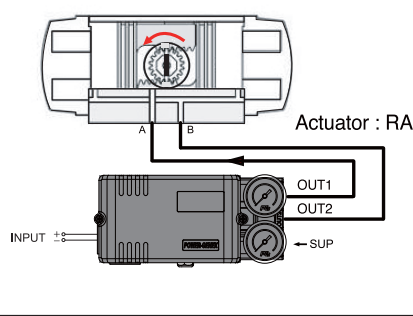
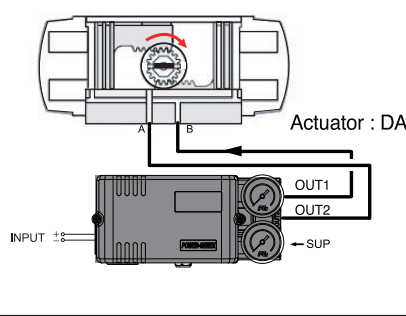
H : Rotary Actuator Shaft Height
L : Length (80 or 130mm)

Air Connections

- SS2L (Linear Type)

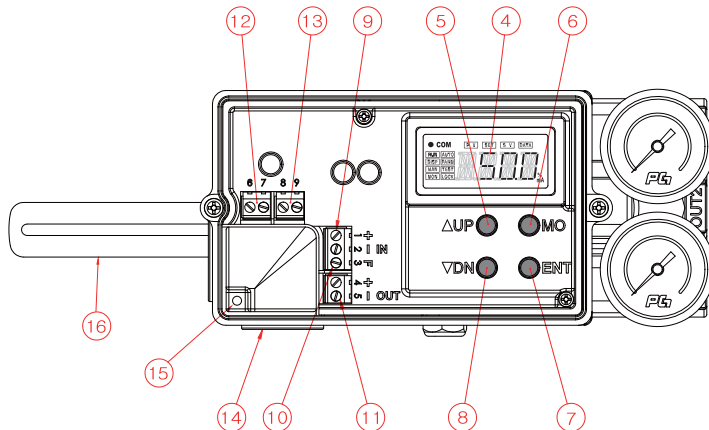
Direct Acting (DA)		Reverse Acting (RA)	
DA 1 As the input signal increases, Valve stem moves downwards Actuator : DA	 OUT2 must be plugged	RA 1 As the input signal increases, Valve stem moves upwards Actuator : RA	 OUT2 must be plugged
DA 2 As the input signal increases, Valve stem moves downwards Actuator : 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	Out 1 : piped, Out2 : plugged	Out 1 : piped to Actuator port A, Out2 : piped to Actuator port B
Direct Acting	Out 1 : plugged, Out2 : piped	Out 1 : piped to Actuator port B, Out2 : piped to Actuator port A

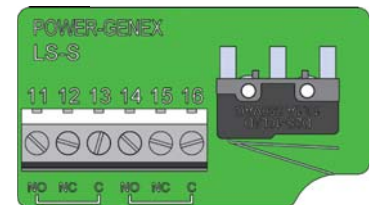
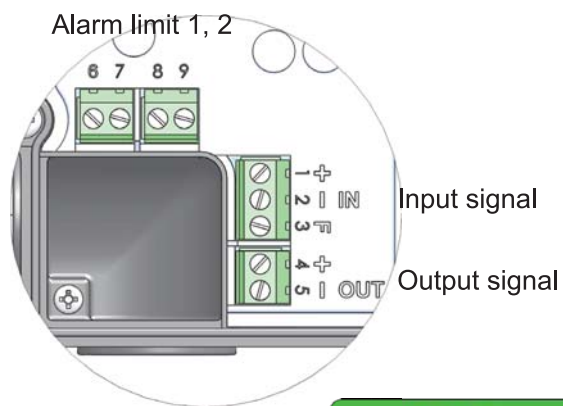
SS2 Front Cover Removed



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

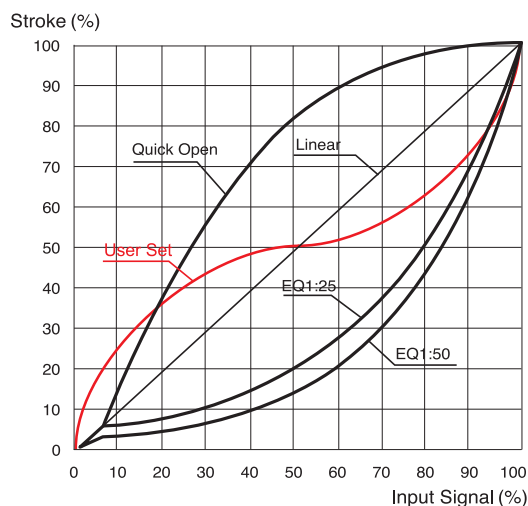
Electrical Connections

- | | |
|--------|---------------------------|
| 1 (+) | IN. 4-20mA input signal |
| 2 (-) | |
| 3 (FG) | Frame Ground |
| 4 (+) | OUT. 4-20mA output signal |
| 5 (-) | |
| 6 (+) | LS1. (Low) Alarm limit 1 |
| 7 (-) | |
| 8 (+) | LS2. (High) Alarm limit 2 |
| 9 (-) | |



Micro switches 1, 2

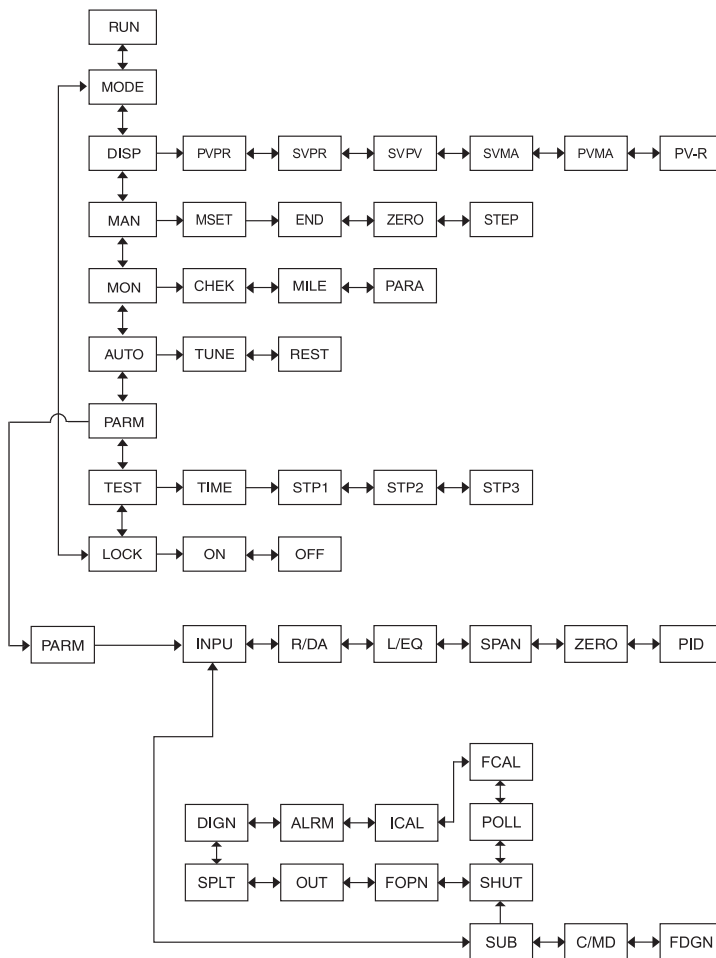
Characteristic Curves



Quick Start and Checking

	Button	Action
Auto - Calibration		Push 5 seconds for auto-calibration
Span	→ or →	Push 5 seconds to change a measured span (Try this option only when a valve doesn't reach a desired position)
Ambient Temp.		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

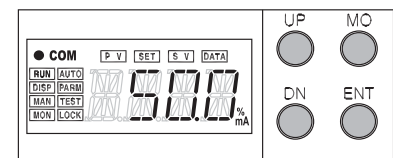
: Shows the selected parameters and a total valve runtime

- : Performs auto-calibration and resets all programmed values

: Main parameters

: Tests in process of 2-step, 4-step, or 10...100%

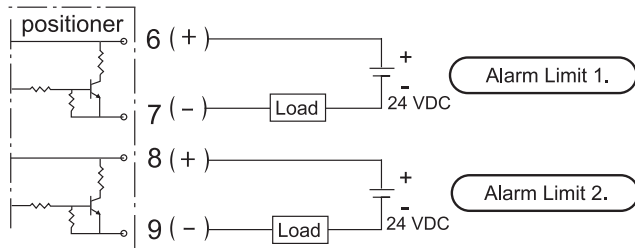
- : Locks the set values



LCD Display
 ● COM : Hart Communication

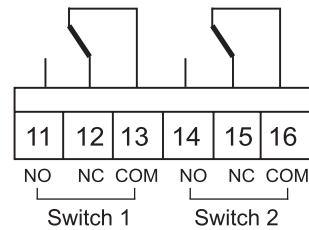
Parameter	Description	Fcution	Default
INPU	Input signal	4 ~ 20mA or 20 ~ 4mA	4 ~ 20mA
R/DA	RA/DA	Reverse acting or direct acting	Auto-set
L/EQ	Characteristic	Linear, E.Q.%(1:25 or 1:50), Quick open or User set(17points)	Linear
SPAN	Span adjustment	0 ~ 100%	100%
ZERO	Zero adjustment	0 ~ 99%	0%
PID	P-GN / 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%
FDGN	D-gain setting for hard mode	D-Gain setting for hard mode	Auto-set
C/MD	NORM / HARD / SMAL	Standard actuator, strong valve packing friction, small actuator	NORM
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 with 4~20mA output signals to a calibrator	Factory setting
POLL	Polling address	HART Communication polling address (0 ~ 15)	0

Wiring Alarm Limits



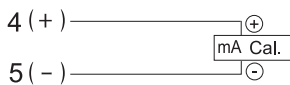
Note that 24 VDC should be supplied for power.

Micro Switches (SPDT)

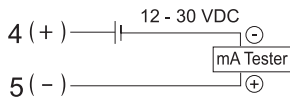


Measuring Output Signal

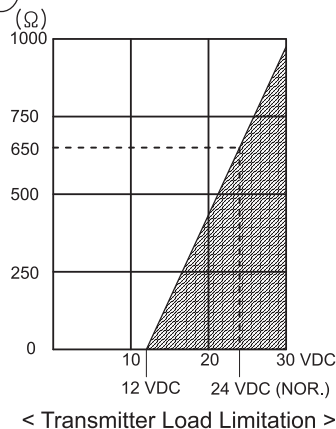
① With mA loop calibrator



② With multimeter (mA)



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



Micro Switches	
Type	SPDT
Rating	10.1A @ 250 VAC
Ambient Temperature	-30 ~ +85 °C
Position Transmitter	
Output Signal	4 - 20 mA, 2-wire
Power Supply	12 - 30 VDC
Output Current Limit	30 mA DC
Linearity	±0.5% F.S
Operating Temperature	-30 ~ +80 °C

How to Order

SS2

Actuator Operation

Protection Class

Feedback Lever

Pressure Gauges

By-pass

Position Feedback

Communication

Connection Threads

Mounting Bracket

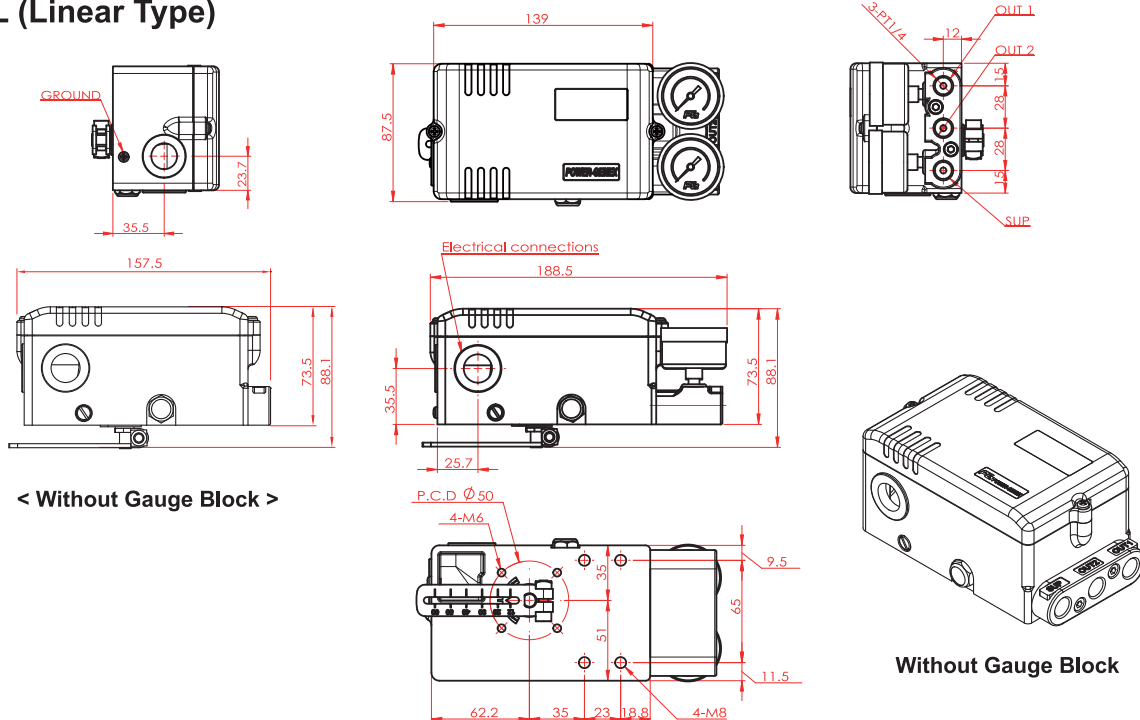
Feedback Pin Guide Lever Set

Description	Code
Actuator Operation :	L : Linear type R : Rotary type
Protection Class :	I : Intrinsically safe (IECEX Ex ia IIC T5 / ATEX Eex ia IIC T5) K : Intrinsically safe (KC Ex ia IIC 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)

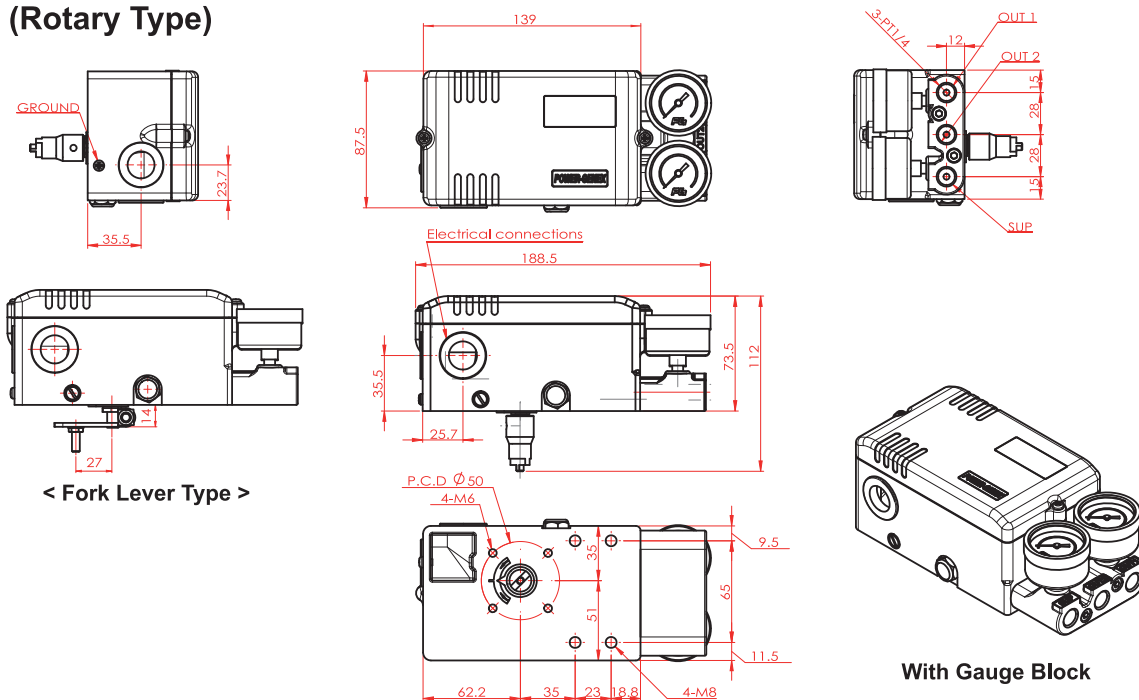
Description	Code
Position Feedback :	N : None O : Position transmitter (4~20mA output signal) L : 2 x alarm limit S : 2 x micro switch (SPDT) M : O + L Q : O + S
Communication :	N : None H : HART P : Profibus (in progress) F : Fieldbus (in progress)
Connection Threads : (pneumatic - electrical)	3 : PT(Rc) 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

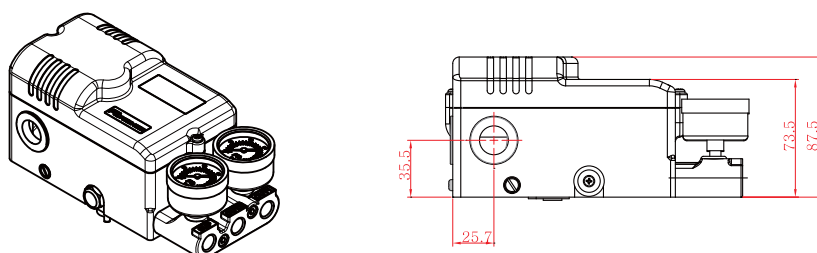
- SS2L (Linear Type)



- SS2R (Rotary Type)



- SS2 with 2 x SPDT Micro S/W



Smart Valve Positioner (remote type)

SS2 Linear / Rotary

NOTE : All sepecifications and characteristics are the same with SS2

How to Order

RSS2

Actuator
Operation

Protection
Class

Feedback
Lever

Pressure
Gauges

By-pass

Position
Feedback

Communi-
cation

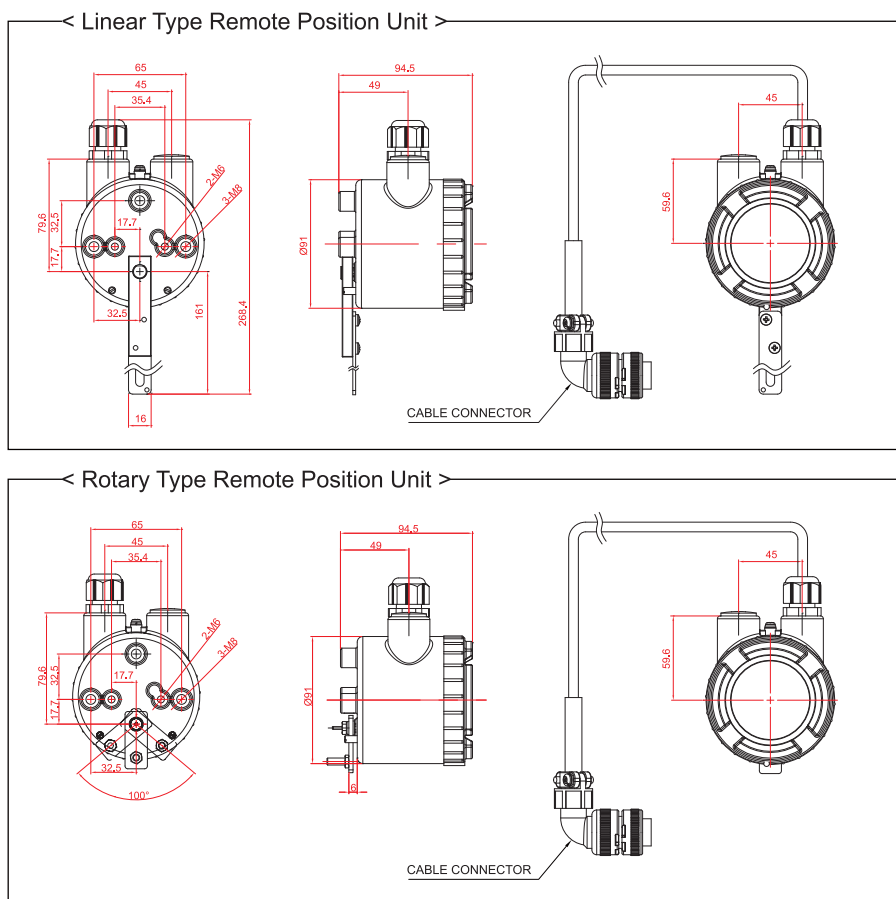
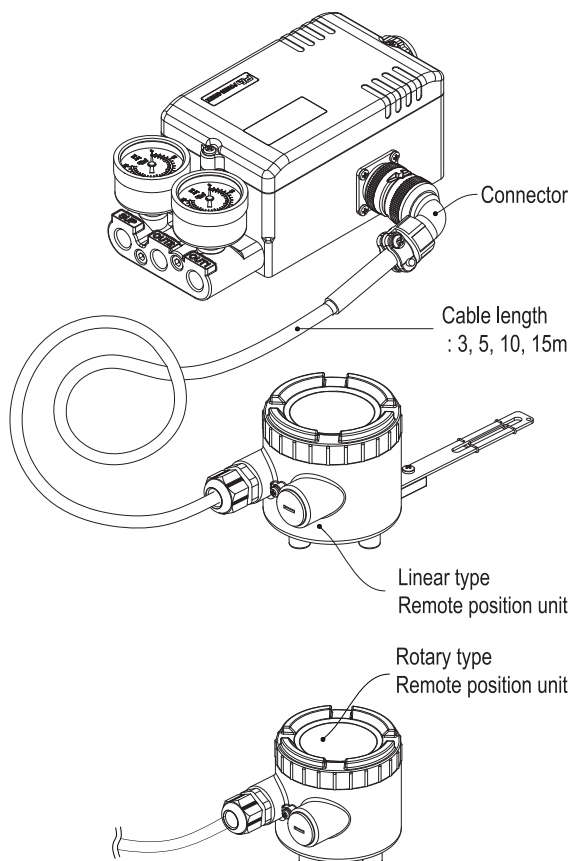
Connection
Threads

Cable
Length

Description	Code
Actuator Operation :	L : Linear type R : Rotary type
Protection Class :	I : Intrinsically safe (IECEX Ex ia IIC T5, ATEX Eex ia IIC T5) K : Intrinsically safe (KC Ex ia IIC T5) W : Weatherproof to IP66
Feedback Lever :	
- Linear type :	A : Stroke (5~40mm) B : Stroke (5~80mm) C : Stroke (5~150mm)
- Rotary type :	F : Fork lever
Gauge Block :	0 : Not mounted 1 : 6 bar (90 psi) 2 : 10 bar (150 psi)

Description	Code
By-pass :	N : None Y : Yes (auto/manual screw)
Position Feedback :	N : None O : Position transmitter (4~20mA output signal) L : 2 x alarm limit M : O + L
Communication :	N : None H : HART P : Profibus (in progress) F : Fieldbus (in progress)
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
Cable Length :	3, 5, 10, 15m Other : On request

Dimensions



Specifications



< SS2SL & SS2SR >



Input Signal	4 - 20 mA @ 24 VDC
Min. / Max. Current	3.6 mA / 50 mA
Voltage Drop (Resistance)	Without Hart : 8.7 VDC (435Ω @ 20 mA) With Hart : 9.4 VDC (470Ω @ 20 mA)
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 ^m /h = 2.8 scfm (Sup = 1.4 bar) 233 l/min = 14 N ^m /h = 8.2 scfm (Sup = 6 bar)
Air Consumption	2 l/min = 0.12 N ^m /h = 0.07 scfm (Sup = 1.4 ~ 6 bar)
Characteristic	Linearity < ±0.3% F.S Sensitivity < 0.2% F.S Hysteresis < 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 °C (- 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 T5)
Body Material	Stainless steel 316
Weight	3.9 kg (without bracket)

* Up to 200mm on request

** -40 °C 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
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Description	Code
Actuator Operation :	L : Linear type R : Rotary type
Protection Class :	I : Intrinsically safe (IECEx Ex ia IIC T5 / ATEX Eex ia IIC T5) K : Intrinsically safe (KC Ex ia IIC 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 :	N : None H : HART P : Profibus (in progress) F : Fieldbus (in progress)
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