Smart Valve Positioner 300 Series

Model AVP300/301/302

OVERVIEW

Smart Valve Positioner 300 Series Models AVP300/301/302 are current-pneumatic smart valve positioners.
The 300 Series receives a DC current signal from control devices and controls pneumatic valves. In addition to this basic function, the 300 Series has communication capabilities, automatic configuration program, and self diagnostics functions that will greatly increase productivity and the efficiency of plant operation.
The model AVP301 has a valve travel transmitter function which transmits a 4–20 mA DC signal. The model AVP302 has a HART communication protocol.

FEATURES

Easy to use

- **Auto setup**

  The auto-setup function is a fully-automatic configuration program which specifies the actuator and adjusts the zero and span of the valve. The program can be turned on simply from an external switch so that adjustments to the valve can be performed quickly and safely in hazardous areas.

Valve diagnostic (Model AVP302 only)

Following parameters can be monitored by HART communicator or Control Valve Maintenance Support System "Valstaff".

- Stick Slip
- Total Stroke
- Travel Histogram
- Cycle Count
- Shut-Off Count
- Max. Travel Speed

High reliability

- **Positive seating**

  The positive seating function completely shuts off the valve if the input signal becomes lower than previously set. This in turn enhances the full shut-off capabilities of the valves.

- **Self-diagnostic**

  The self-diagnostic function provides with the ability to check the status of the positioner at any time and to alert in case of failure.

Single model for multiple specifications

The 300 Series' settings can be changed without replacing any parts. A single model can be modified to suit any application.

- **Input range:**

  Configurable to any required range for split range

- **Flow characteristic:**

  Linear, EQ%, Quick opening or custom user characteristics

- **Actuator type:**

  Single or double acting actuator (optional reversing relay required)

Travel transmission

The model AVP301 transmits a 4–20 mA signal proportional to the valve travel. The valve travel can be monitored from the control room.

The wiring method differs depending on whether this device is used as a normal current-pneumatic positioner or as a positioner with a travel transmission function. When using this device as a normal current-pneumatic positioner, it is necessary only to connect the positioner to the host controller with an input signal cable (4–20 mA DC) as with previous models. Figures 1 and 2 show the wiring diagrams.

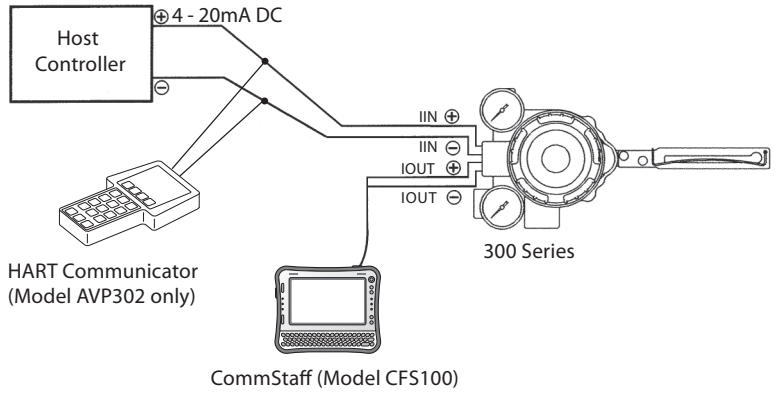


Figure 1. Normal current-pneumatic positioner (model AVP300/302)

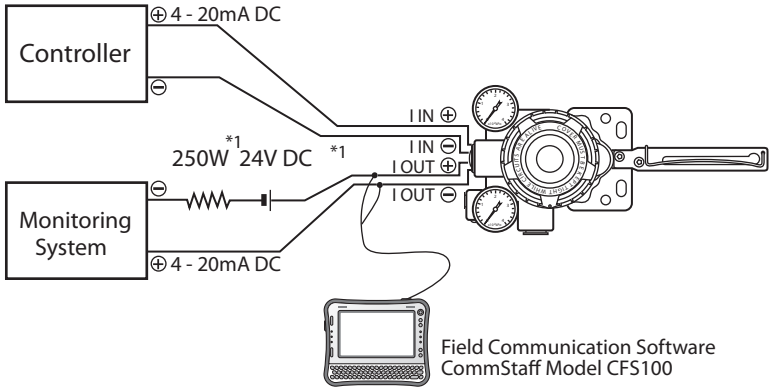


Figure 2. Positioner with travel transmission function (model AVP301)

**1. For load resistance, refer to Figure 3.*

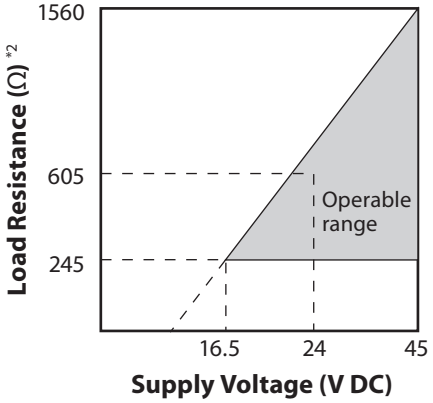


Figure 3. Supply voltage for travel transmission vs. load resistance characteristic

Note) Supply voltage shall be limited to 45 V DC

**2. Load resistance = Resistance for Monitoring system + 250 W*1 + Resistance of supply voltage*1*

Table 1. Standard travel range and accuracy

Actuator	Travel (mm)	Accuracy [% F.S.]
PSA1, 2	14.3, 20, 25	1.0
PSA3, 4	20, 38	1.0
HA1	6, 8, 10	3.0
	14.3, 25	1.0
HA2	10	3.0
	14.3, 25, 38	1.0
HA3	14.3	3.0
	25, 38, 50	1.0
HA4	14.3	3.0
	25, 38, 50, 75	1.0
VA5	25, 37.5, 50, 75, 100	1.0
VA6	14.3	3.0
PSA6, 7	25, 37.5, 50, 75, 100	1.0
HK1	10	3.0
PSK1	19	1.0

LIST OF FEATURES

Item	Function
Desired input signal range	Any split-range value can be specified.
Forced fully open/closed	The control valve can be fully closed or opened securely when the desired percentage of input signal is reached.
Desired flow characteristics	The relationship between input signal and valve travel that is appropriate for the process can be defined by using a 15-point broken line.
Travel transmission (option)	Valve motion can be reliably monitored by transmitting the valve travel.

FUNCTIONAL SPECIFICATIONS

Item	Specification
Applicable actuator	Pneumatic single and double acting, linear and rotary motion actuator
Input signal	4–20 mA DC (Configurable to any required range for split range.) Minimum driving current: 3.84 mA In case of model AVP301 when signal input is less than 3.85 mA, output current will be burnout.
Output signal	4–20 mA DC (Travel transmission)
Input resistance	300 Ω typically / 20 mA DC (Model AVP300/301) 400 Ω typically / 20 mA DC (Model AVP302)
Lightning protection	Peak value of voltage surge: 12 kV Peak value of current surge: 1000 A
Flow characteristics	Linear, Equal percentage, Quick opening Custom user characteristics (15 segments)
Manual operation	Auto/Manual external switch (For single acting actuator only)
Supply air pressure	140 to 700 kPa
Air consumption	for single acting actuator 4 L/min (N) or less: with steady supply air pressure of 140 kPa {1.4 kgf/cm²} and output of 50 % 5 L/min (N) or less: with steady supply air pressure of 280 kPa {2.8 kgf/cm²} and output of 50 % 6 L/min (N) or less: with steady supply air pressure of 500 kPa {5.0 kgf/cm²} and output of 50 % for double acting actuator 10 L/min (N) or less: with steady supply air pressure of 400 kPa {4.0 kgf/cm²}
Output balanced pressure	55±5% for double acting actuator only
Maximum air deliver flowrate	for single acting actuator 110 L/min (N) maximum at 140 kPa {1.4 kgf/cm²} for double acting actuator 250 L/min (N) maximum at 400 kPa {4.0 kgf/cm²}
Air connections	Rc1/4 or 1/4NPT internal thread
Electrical connections	G1/2, 1/2NPT or M20 × 1.5 internal thread
Ambient temperature limits	-40 to +80°C for general model TIIS Flameproof: -20 to +55°C KOSHA Flameproof: -20 to +55°C FM Explosionproof: -40 to +80°C FM Intrinsically safe: -40 to +80°C ATEX Flameproof: -40 to +75°C ATEX Intrinsically safe: -40 to +60°C CSA Explosionproof: -40 to +80°C NEPSI Flameproof: -40 to +60°C NEPSI Intrinsically safe For Ex ia IIC T6: -40 to +40°C For Ex ia IIC T5: -40 to +60°C For Ex ia IIC T4: -40 to +80°C
Ambient humidity limits	10 to 90 %RH
Vibration characteristics	20 m/s², 5 to 400 Hz (with standard mounting kit on Azbil Corporation's HA actuator)
Finish	Baked acrylic
Color	Dark blue
Material	Cast aluminum
Weight	For single acting actuator Without Pressure regulator with filter: 2.5 kg With Pressure regulator with filter: 3.2 kg For double acting actuator Without Pressure regulator with filter: 2.8 kg With Pressure regulator with filter: 3.5 kg

Item		Specification	
Performance	Accuracy	For 8 mA ≤ input signal span < 16 mA ±1% F.S. (±2.5% with user-defined flow characteristics) For 4 mA ≤ input signal span < 8 mA ±1.5% F.S. (Refer to Table 1. Because accuracy varies depending on the combination of actuator size and travel.)	
	Travel transmission accuracy *	±1 %F.S. (±2.5 % with user-defined flow characteristics)	
	Stroke coverage	14.3 to 100 mm Stroke (Feedback Lever Angle ±4° to ±20°)	
Enclosure classification		JIS C0920 watertight, NEMA type 4X, IP66	
Configuration tools		Field Communication Software CommStaff Model CFS100	
Approvals		TIIS Flameproof	Ex d IIC T6 X Certificate No. TC20800
		KOSHA Flameproof	Ex d IIC T6
		FM Explosionproof	Explosionproof Class I, Division 1, Group A, B, C, D Dust-ignition Class II, Division 1, Group E, F, G Suitable Class III, Division 1 Flameproof Class I, Zone 1, AEx d IIC T6 at Ambient temperature < 80°C Installation should comply with NEC.
		FM Intrinsically safe	Intrinsically safe Class I, II, III, Division 1, Group A, B, C, D, E, F, G, T4 Intrinsically safe Class I, Zone 0, AEx ia IIC T4, Ta = 80°C The barriers should be FM recognized types and comply with the following conditions as follows: Input signal line: 12.02 ≤ Vmax ≤ 30 V, Imax = 100 mA, Pmax = 1 W, Ci = 0 µF, Li = 0.22 mH For travel transmission line: Vmax = 30 V, Imax = 100 mA, Pmax = 1 W, Ci = 0.07 µF, Li = 0.22 mH Installation should comply with NEC. Nonincendive Class I, Division 2, Group A, B, C, D, T5, Ta = 80°C Suitable Class II, Division 2, Group F, G, T4, Ta = 80°C
		ATEX Flameproof	II 2 G Ex d II C T6 Gb -40°C ≤ Tamb ≤ +75°C IEC IP66 Certificate No. DEKRA 14ATEX0120 X Flameproof cable gland must be Ex d IIC approved.
		ATEX Intrinsically safe	II 1 G Ex ia IIC T4 II 1 D Ex iaD 20 IP66 T135°C Certificate No. KEMA 00ATEX1111 X IEC IP66 The barriers should be ATEX certified types and comply with the following condition as follows: Input circuit (terminals ±IIN) Ui = 30 V, Ii = 100 mA (resistively limited), Pi = 1 W, Ci = 1 nF, Li = 0.2 mH Output circuit (terminals ±IOUT) Ui = 30 V, Ii = 100 mA (resistively limited), Pi = 1 W, Ci = 3 nF, Li = 0.2 mH Both circuits shall be considered to be connected to ground from a safety point of view.

* *This applies only to positioners with travel transmission (model AVP301). In this case, a power supply circuit for travel transmission is required.*

Item	Specification	
Approvals	CSA Explosionproof	Explosionproof Class I, Division 1, Group B, C,and D Flameproof Class I, zone 1, Ex d IIC, T6 Dust ignition proof Class II and III Division 1, Group E, F and G Type 4X, Certificate No. 188352-1028066 (LR113752-6)
	NEPSI Flameproof	Ex d IIC T6, with NEPSI Dust ignition DIP A20 Ta T6 Flameproof cable gland must be NEPSI Ex d IIC approved.
	NEPSI Intrinsically safe	Ex ia IIC T4-T6 The barriers should be NEPSI certified types and comply with the following condition as follows: Input circuit (terminals ±IIN) Ui = 30 V, Ii = 95 mA Pi = 0.66 W, Ci = 0μF Li = 0.2 mH Output circuit (terminals ±IOUT) Ui = 30 V, Ii = 95 mA Pi = 0.66 W, Ci = 0μF Li = 0.2 mH
	Combination of NEPSI Flameproof and Intrinsically safe	When used as NEPSI Flameproof, it complies NEPSI Flameproof approval as above, When used as NEPSI Intrinsically safe, it complies NEPSI Intrinsically safe approval as above.
CE conformity	Electromagnetic compatibility EN61326-1: 2013 (CE Marking)	

Conditions of supply air (JIS C1805-1 (2001))

Item	Specification
Particles	Maximum diameter 3 μmm
Oil mist	Less than 1 ppm at mass
Humidity of the air supply	The dew point should be at least 10°C lower than the temperature of this device.

To meet the above specifications for instrument air, install the air purification devices listed below properly in the specified installation location.

Examples of air purification devices

Installation	Air purification device	SMC corporation	CKD corporation
Compressor outlet or main line	Line filter	AFF series	AF series
	Mist separator	AM series	
Terminal device	Air combination	AW30	M3000S type

MODEL SELECTION

Basic model number

			(1)	(2)	(3)	(4)	(5)
AVP300	Analog signal (4 to 20 mA DC) without position transmission	-					
AVP301	Analog signal (4 to 20 mA DC) with position transmission						
AVP302	Analog signal (4 to 20 mA DC) HART protocol						

		(Air pipes, conduit connections)	
(1) Main unit model number	Water-proof	(Rc1/4, G1/2)	X
	Water-proof	(1/4 NPT, 1/2 NPT)	P
	Water-proof	(1/4 NPT, M20 X 1.5)	Q
	TIIS special explosion-proof model (with flameproof cable gland *1)	(Rc1/4, G1/2)	E
	KOSHA flameproof	(Rc1/4, G1/2)	S
	FM flameproof	(1/4 NPT, 1/2 NPT)	F
	FM intrinsically safe explosion-proof	(1/4 NPT, 1/2 NPT)	M
	ATEX flameproof	(1/4 NPT, M20 X 1.5)	C
	ATEX intrinsically safe explosion-proof	(1/4 NPT, M20 X 1.5)	L
	CSA flameproof	(1/4 NPT, 1/2 NPT)	A
	NEPSI flameproof	(1/4 NPT, 1/2 NPT)	B
	NEPSI flameproof	(1/4 NPT, M20 X 1.5)	N
	NEPSI flameproof, intrinsically safe explosion-proof model	(1/4 NPT, 1/2 NPT)	R
	NEPSI flameproof, intrinsically safe explosion-proof model	(1/4 NPT, M20 X 1.5)	W

(2) Finish	Standard finish	S
	Corrosion-resistant finish	B
	Silver	D

(3) Positioner action * 2	Direct operation (standard)	D
	Reverse operation (reverse positioning)	R

		(pressure gauge range, max. voltage setting of regulator)	
(4) Supply air pressure type	130 ≤ Ps ≤ 150 kPa	(200 kPa, 400 kPa)	1
	150 < Ps ≤ 300 kPa	(400 kPa, 400 kPa)	2
	300 < Ps ≤ 400 kPa	(600 kPa, 400 kPa)	3
	400 < Ps ≤ 450 kPa	(600 kPa, 700 kPa)	4
	450 < Ps ≤ 700 kPa	(1000 kPa, 700 kPa)	5

(5) Pressure units	kPa	A
	(kgf/cm^2) * 3	(B)
	MPa	C
	bar	D
	(psi) *3	(E)

1. Model AVP300/302 includes one flameproof cable gland, and model AVP301 includes two.

2. When the input signal (power) is shut off, select direct action to make the output air pressure of this device zero, and reverse action to make the output at the maximum air pressure (supply air pressure). Positioner action differs from actuator and control valve action, so be careful in selecting the positioner's action.

3. Items in parentheses are for overseas use. As such, they cannot be used in Japan.

Individual specifications

Following shows default and optional settings of each configurable parameter of AVP.
Unless otherwise specified, the Smart Valve Positioner will be shipped in the following configuration.

Input control signal	4 to 20 mA	The minimal span for custom range = 4 mA
Output characteristic *1	Liner	EQ or QO can be ordered or set by user.
Valve action *2	Direct (Plug above seat)	Reverse (Plug below seat) can be ordered or set by use
Output signal for position transmission	4 to 20 mA	DE also selectable

**1. Refer to the following when selecting the input/output characteristics.*

**2. Positioner action differs from actuator and control valve action, so be careful in selecting the positioner's action.*

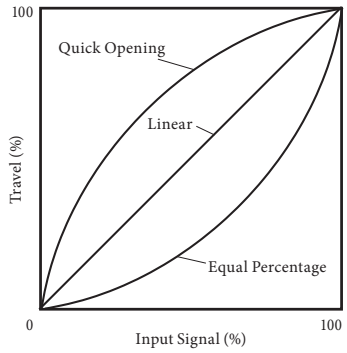


Figure 4. Input-output characterization

Selection of input characterization

The flow characteristic of a control valve is set by selecting the valve plug characteristic, and the input-output characteristics of the positioner must be specified as linear. However, if the valve plug flow characteristic, which depends on the control valve's shape and structure, does not meet requirements, you can correct the overall flow characteristic of the control valve by specifying "equal percentage" or "quick opening" for the input-output characteristics of the positioner, as shown in Table 2.

Table 2. Control valve flow characteristics correction by the positioner

Characteristic of valve plug	Input-output characterization of positioner	Overall flow characteristic of control valve
Linear	Quick opening	Quick opening
Linear	EQ%	EQ%
EQ%	Quick opening	Linear

Note: If the valve plug characteristic is "quick opening," the overall flow characteristic of the control valve cannot be linear even if "equal percentage" is set for the positioner's input-output characteristics. (This is because when the valve plug characteristic is "quick opening," the control valve works as an ON/OFF valve and it is difficult to correct its characteristics by changing the setting of the positioner.)

Accessory Selection			-	(6)	(7)	(8)	(9)	-	(10)
(6) Regulator with filter		Without regulator		X					
		With model KZ03 regulator (attached to main unit)		1					
		With model KZ03 regulator (with mounting plate for separate installation)		2					
(7) Mounting bracket material (mounting plate/bolts)		No mounting plate			X				
		SS400 standard zinc-plating / SUS304			C				
		SUS304 / SUS304			D				
(8)(9) Mounting bracket for attachment to actuator *7		No mounting plate				XX			
	Single-acting actuators	PSA1, PSA2, PSK1				YS			
		New model of PSA3, PSA4 / VA1 to VA3 produced after 2000 *1				YQ			
		PSA3, PSA4 for existing valves produced on/before 1999				YY			
		PSA6/VA4 to VA6 produced after Apr.'83 *1				YL			
		PSA7				Y8			
		HA1				YA			
		HA2, HA3, HL2, HL3				YT			
		HA4, HL4				YN			
		HK1, VM1 *4				YK			
		VM12 for model VSP *3				YB			
		VR1				YV			
		VR2, VR3				YR			
		VR3H				Y6			
		RSA1				YF			
		RSA2				YU			
		GOM 83S, GOM 84S, GOM 103S				YG			
		GOM 124S				YM			
		VA1 - VA3 (for old-model motion connectors) Produced on/before Apr.'83 800-1, 800-3 *2				YW			
		VA4 - VA5 (for old-model motion connectors) Produced on/before Apr.'83 800-4, 800-5 *2				YJ			
		Actuators of other manufacturers				See Table 3			
	Double-acting actuators	VP5, 6 *5				Y1			
		VP7 *5				Y7			
		SLOP560, 1000, 1000X *5 *6				Y2			
		SLOP1500, 1500X *5 *6				Y3			
		DAP560, 1000, 1000X *5 *6				Y4			
		DAP1500, 1500X *5 *6				Y5			
		Actuators of other manufacturers				See Table 4			
(10) Option		None							X
		Explosion-proof universal elbow (SUS304 G1/2) (1)							A
		Explosion-proof universal elbow (SUS304 G1/2) (2)							C
		Mounting screw Unify (5/16-18UNC) (Electrical conduit connection only supports 1/2NPT)							T
		Double-acting reversing relay							W

1. Select "YW" or "YJ" for old-type motion connectors. (Produced on/before Apr.'83)

2. Consult with sales representative in case of no mounting hole on the side of valve yoke.

3. Additional support bracket is required.

4. In case "VM" type actuator is required following conditions, 1. select model "VCT" for the body, 2. the existing positioner should be HEP or VPE, 3. yoke should be model HK. If another spec. is required, contact your sales representative.

5. In case of double acting actuator, a reversing relay unit required.

6. Contact a sales representative if a bracket for model VFR (FloWing) or butterfly valve is required.

7. Accuracy differs depending on the actuator's stroke; see Table 1.

Table 3. Mounting bracket for single acting actuator

(8)(9) Mounting bracket for pneumatic actuator	Code
Motoyama Mfg. 2800 series 240, 280, 330, Nihon Koso A100 series 270, 320 *	TA
Motoyama Mfg. 2800 series 400, 500S, 500L,Nihon Koso A100 series 400, 500 *	TB
Motoyama Mfg. 2800 series 650S, 650L	TC
Motoyama Mfg. 2800 series 240, 280, 330 (with side manual)	TD
Motoyama Mfg. 2800 series 400, 500S, 500L (with side manual)	TE
Motoyama Mfg. 2800 series 650S, 650L (with side manual)	TF
Motoyama Mfg. 3800 series (multi-spring type) N24, N28, N33S	TJ
Motoyama Mfg. 2922 series (Gyrol-I) G.R.I 280H, 330H, 400HS, 400H, 500H	TL
Motoyama Mfg. 3993 series (Gyrol-II) 2911-1M series 280, 330, 400	TG
Nihon Koso 5100L series 240, 280 *	TP
Nihon Koso 5200L series 218, 270, 350 *	TR
Masoneilan 37, 38 series #9, #11 *	MA
Masoneilan 37, 38 series #13 *	MB
Masoneilan 37, 38 series #15, #18 *	MC
Masoneilan 37, 38 series #15, #18 (with side manual)	MF
Masoneilan type 35002 series Camflex II #41/2, #6, (Valve size 1 inch - 4 inches)	MG
Masoneilan type 35002 Camflex II #7 (Valve size 6 inches - 12 inches)	MH

(8)(9) Mounting bracket for pneumatic actuator	Code
Fisher 657, 667 series size 40	FB
Fisher 657, 667 series size 45, 50	FC
Fisher 657, 667 series size 60	FD
Pentair Valve and Control Japan AK09S, AK12S, AK15S	KA
Pentair Valve and Control Japan AG06S, AGN06S	KG
Pentair Valve and Control Japan AG09S, AGN09S	KH
Pentair Valve and Control Japan AG13S, AGN13S	KJ
Pentair Valve and Control Japan AW13S	KV
Pentair Valve and Control Japan AW17S	KW
Pentair Valve and Control Japan AW20S	KT
KITZ B series BS-2, BSW-2	B2
KITZ B series BS-3, BSW-3, Hisaka TS-6	B3
KITZ B series BS-4, BSW-4	B4
KITZ B series BS-5, BSW-5	B5
KITZ B series BS-6, BSW-6	B6
Xomox (EL-O-MATIC) E25, 40, 65, 100, 200, 350	RA
Xomox (EL-O-MATIC) E600, 950, 1600, P2500, P4000	RB
Hisaka TS-1	H1
Hisaka TS-2	H2
Hisaka TS-3	H3
Hisaka TS-4, 5	H4
Tomoe Valve Z series Z-06S, 08S, 11S, 13S	EA
Tomoe Valve T-matic 3Q-1, 2, 3, 4	E3

* *Select in the case of without manual handle or with manual handle mounted on top of the actuators.*

Table 4. Mounting bracket for double acting actuator

(8)(9) Mounting bracket for pneumatic actuator		Code
Pentair Valve and Control Japan AK09, AK12, AK15	*	KA
Pentair Valve and Control Japan AG06, AGN06	*	KG
Pentair Valve and Control Japan AG09, AGN09	*	KH
Pentair Valve and Control Japan AG13, AGN13	*	KJ
Pentair Valve and Control Japan AW13	*	KV
Pentair Valve and Control Japan AW17	*	KW
Pentair Valve and Control Japan AW20	*	KT
KITZ B series B-2	*	B2
KITZ B series B-3	*	B3
KITZ B series B-4	*	B4
KITZ B series B-5	*	B5
KITZ B series B-6	*	B6
Xomox (EL-O-MATIC) E25, 40, 65, 100, 200, 350	*	RA
Xomox (EL-O-MATIC) E600, 950, 1600, P2500, P4000	*	RB
Tomoe Valve Z series Z-06, 08, 11, 13	*	EA
Tomoe Valve T-matic 3I-1, 2, 3, 4	*	E3
T. V. VALVE AT4-80	*	V1
T. V. VALVE AT4-100	*	V2
T. V. VALVE AT4-120	*	V3
T. V. VALVE AT4-150	*	V4
T. V. VALVE AT4-180	*	V5

* *In case of double acting actuator, a reversing relay unit required.*

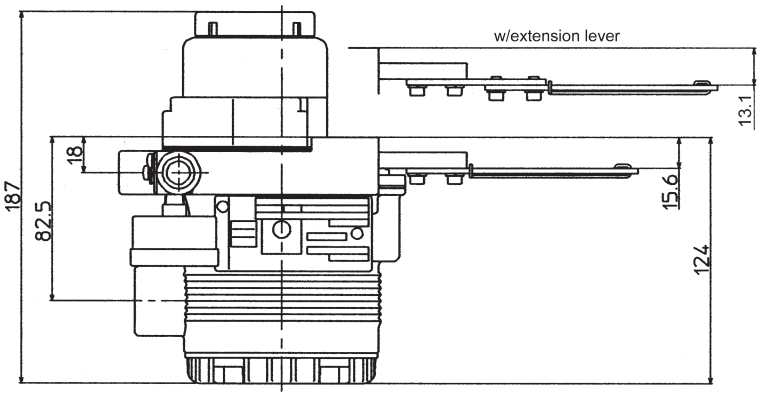
Table 5. Standard travel range and accuracy

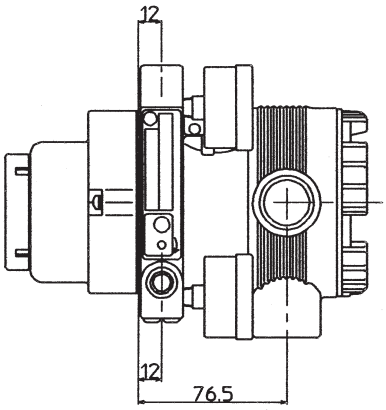
Actuator	Travel (mm)	accuracy [% F.S.]
PSA1, 2	14.3, 20, 25	1
PSA3, 4	20, 38	1
HA1	6, 8, 10	3
	14.3, 25	1
HA2	10	3
	14.3, 25, 38	1
HA3	14.3	3
	25, 38, 50	1
HA4	14.3	3
	25, 38, 50, 75	1
VA5	25, 37.5, 50, 75, 100	1
VA6 PSA6, 7	14.3	3
	25, 37.5, 50, 75, 100	1
HK1 PSK1	10	3
	19	1

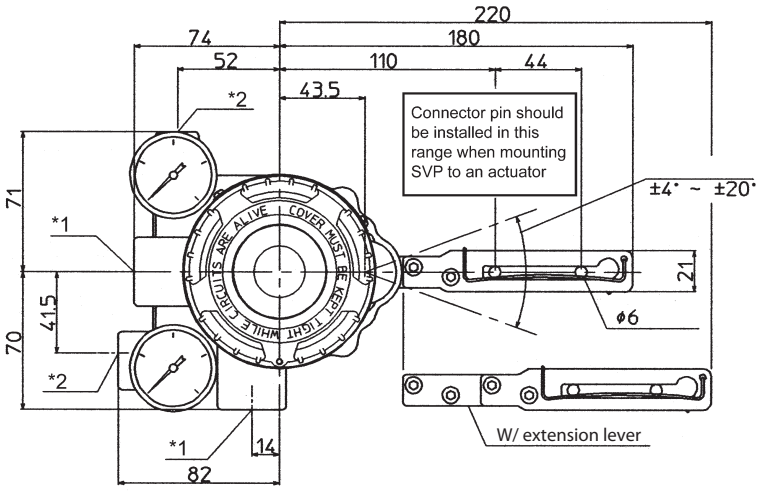
DIMENSIONS

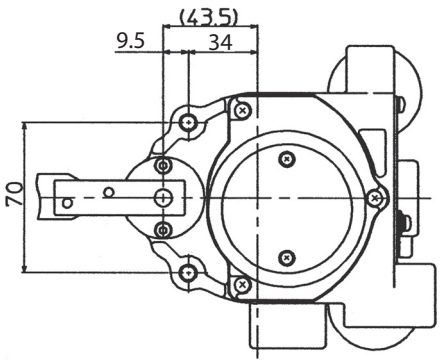
For single acting actuator without pressure regulator with filter

[Unit: mm]

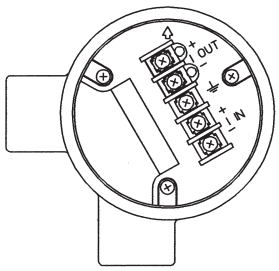






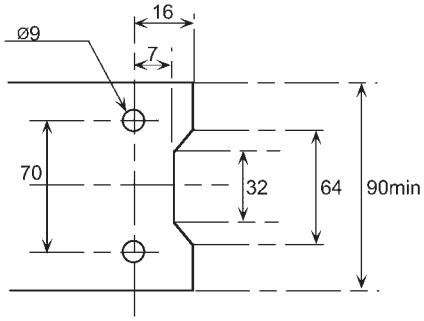


Mounting plate reference dimension



Terminal connections
Terminal screw size M4

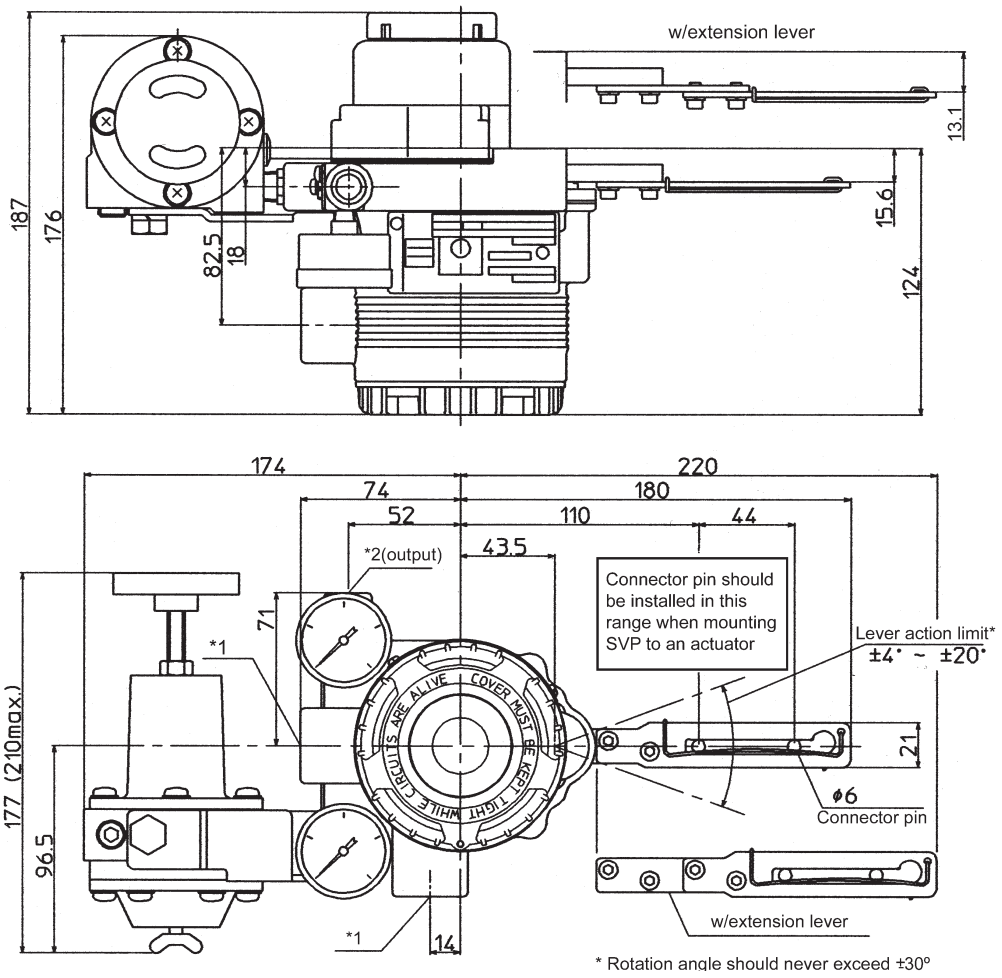
Extension lever	Actuator model	Code
No	PSA1, 2, PSK1	YS
	HA1	YA
	HA2, 3	YT
	HK1	YK
Yes	PSA3, 4 VA1 to 3	YQ
	PSA6	YL
	PSA7	Y8
	HA4	YN
	VA4 to 6	YL
	VR1	YV
	VR2, 3	YR
	GOM83S, 84S, 103S	YG
	GOM124S	YM

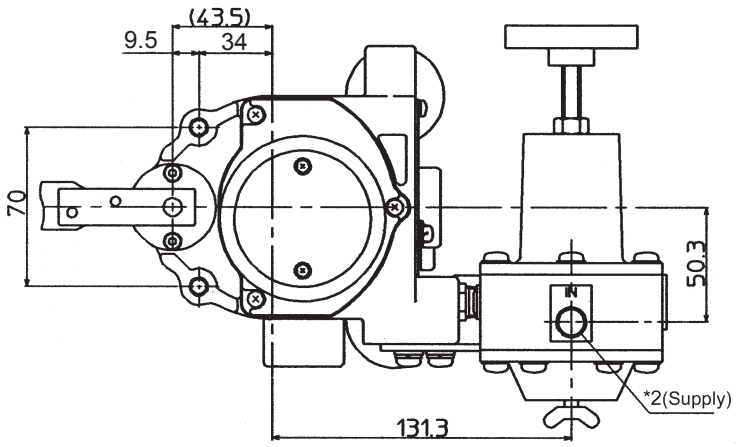


Types	Electrical connection	Air piping connection
TIIS and KOSHA Flameproof or water-proof type	G1/2	Rc1/4
FM and CSA approvals, NEPSI approvals or water-proof type	1/2NPT	1/4NPT
ISSeP/ATEX Flameproof, KEMA/ATEX intrinsically safe, NEPSI approvals or water-proof type	M20×1.5	1/4NPT
Parts on drawings	*1	*2

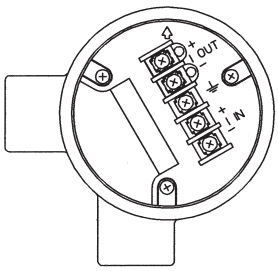
For single acting actuator with pressure regulator with filter

[Unit: mm]





Extension lever	Actuator model	Code
No	PSA1, 2, PSK1	YS
	HA1	YA
	HA2, 3	YT
	HK1	YK
Yes	PSA3, 4 VA1 to 3	YQ
	PSA6	YL
	PSA7	Y8
	HA4	YN
	VA4 to 6	YL
	VR1	YV
	VR2, 3	YR
	GOM83S, 84S, 103S	YG
	GOM124S	YM

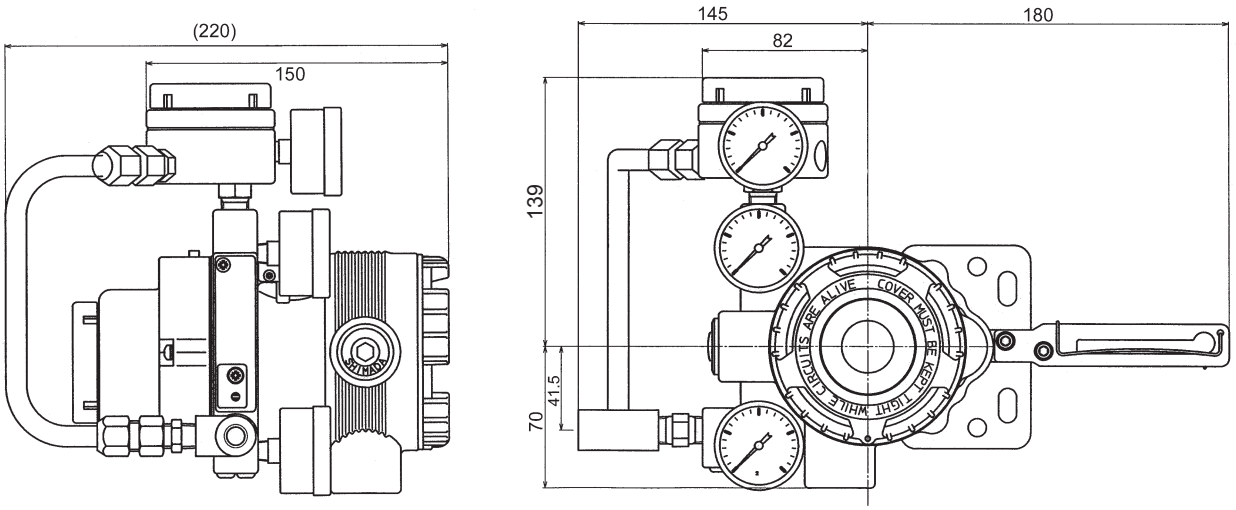


Types	Electrical connection	Air piping connection
TIIS and KOSHA Flameproof or water-proof type	G1/2	Rc1/4
FM and CSA approvals, NEPSI approvals or water-proof type	1/2NPT	1/4NPT
ISSeP/ATEX Flameproof, KEMA/ATEX intrinsically safe, NEPSI approvals or water-proof type	M20×1.5	1/4NPT
Parts on drawings	*1	*2

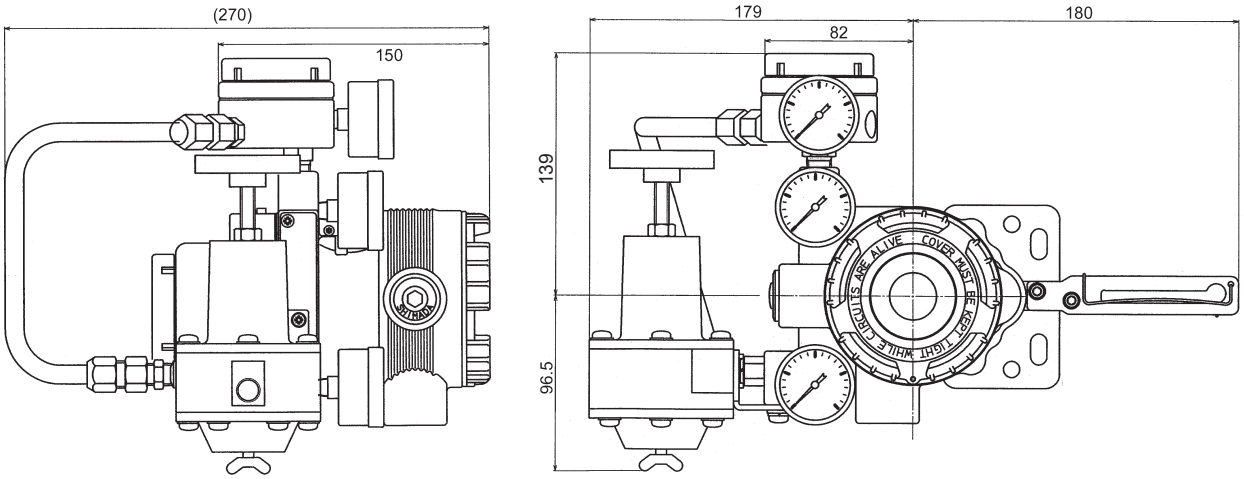
For double acting actuator with reversing-relay

[Unit: mm]

Without pressure regulator with filter



With pressure regulator with filter



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