Pneumatic-Pneumatic Positioner

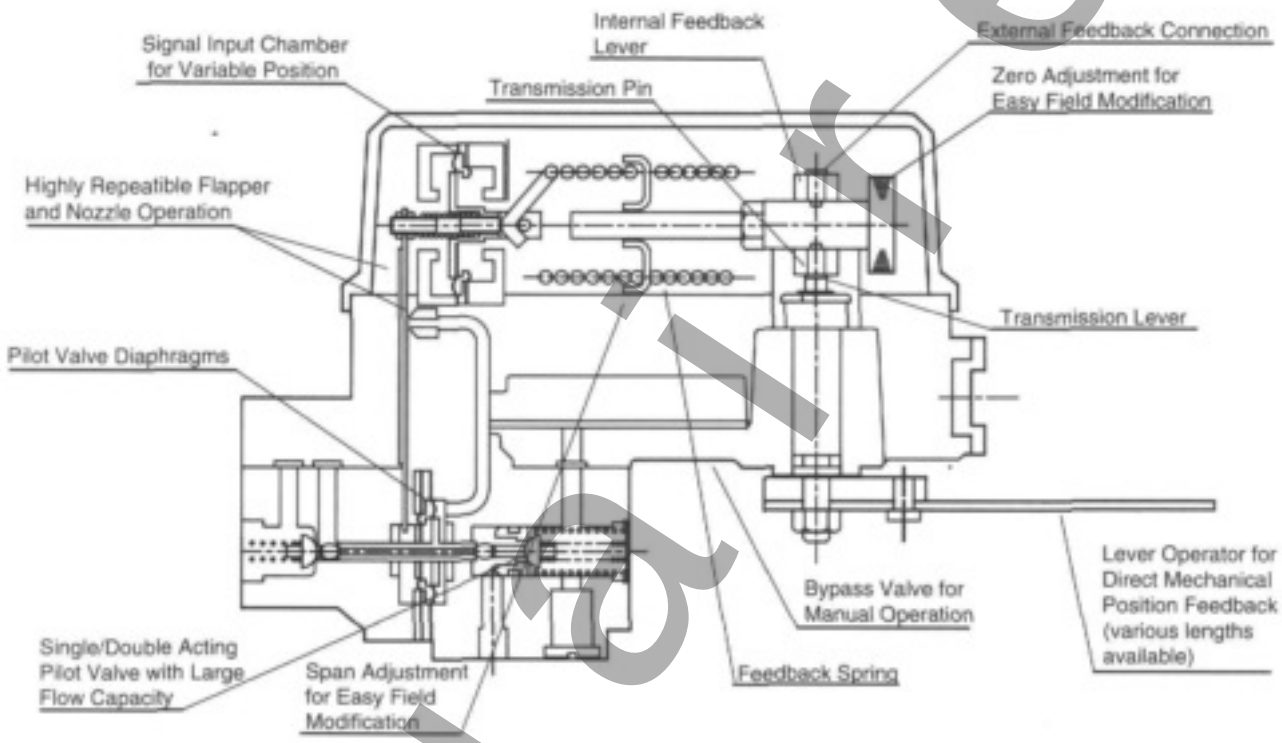
IP300/IP3100

Pneumatic Positioning of Actuators

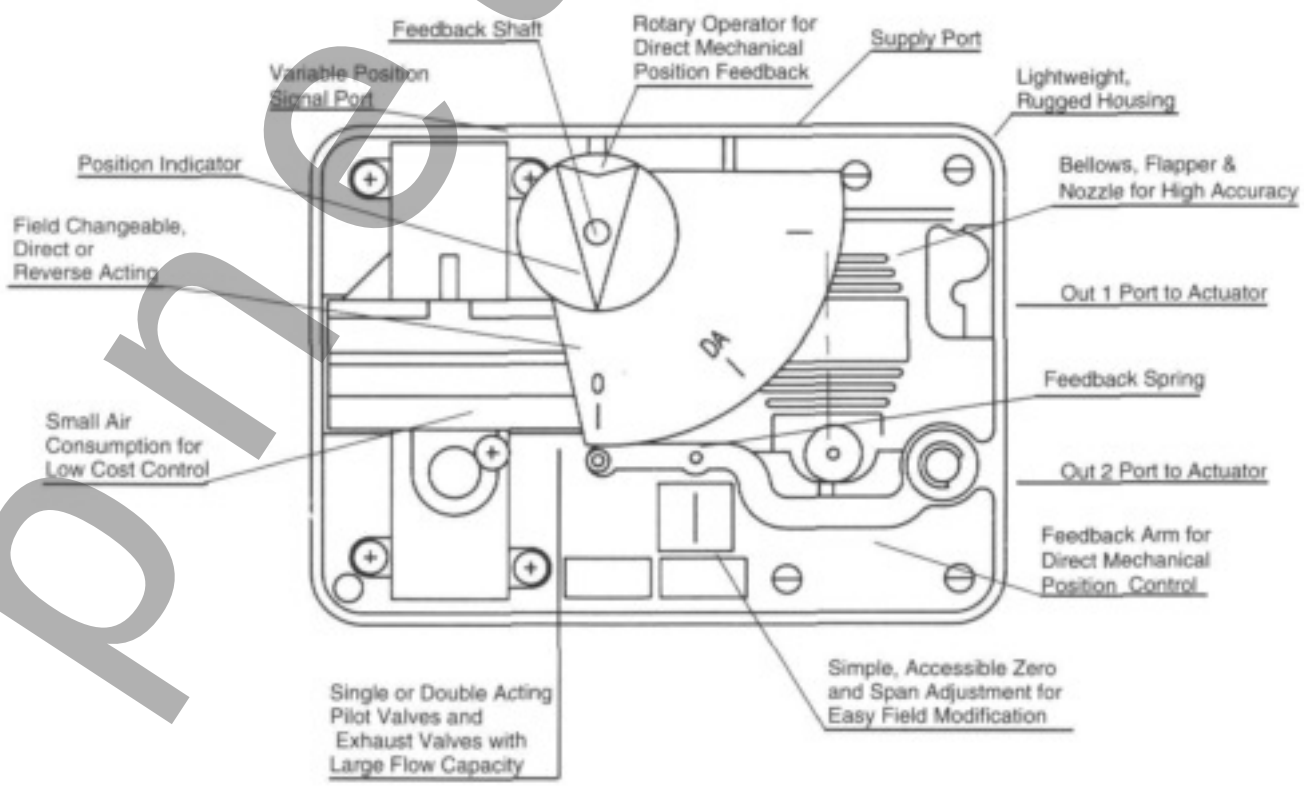
Single or double acting models
Lever or Rotary Models
Linearity ±2% or less
Hysteresis within 1% or less
Repeatability within 1% or less

FEATURES AND BENEFITS

Model IP300 (Lever Type)



Model IP3100 (Rotary Type)



SPECIFICATIONS

Characteristic	Standard Temperature 20° F To 140° F		High Temperature 20° F To 212° F		Low Temperature -20° F To 140° F	
	Single Acting	Double Acting	Single Acting	Double Acting	Single Acting	Double Acting
Supply Pressure	20 to 100 psi					
Signal Pressure♦	3 to 15 psi (split ranging possible)					
Rotary Angle (stroke)	10° to 28° (10-85mm) (0.3" to 3.4" std.) (5.9" max.)					
Linearity*	Within ± 1%	Within ± 2%				
Hysteresis*	Within 1%					
Repeatability*	Within 0.5%	Within 1%				
Sensitivity	Within 0.1%	Within 0.5%	Within 0.2%	Within 1%	Within 0.2%	Within 1%
Air Consumption (Max.) less than	0.25 SCFM @ 20 psi	0.7 SCFM @ 70 psi	0.25 SCFM @ 20 psi	0.7 SCFM @ 70 psi	0.25 SCFM @ 20 psi	0.7 SCFM @ 70 psi
Supply Pressure Variation Effect (Max.)	Within 0.3% for each 1.5 psi	Within 0.5% for each 7.5 psi	Within 0.5% for each 1.5 psi	Within 1% for each 1.5 psi	Within 0.5% for each 1.5 psi	Within 1% for each 7.5 psi
Flow Capacity	12.5 SCFM @ 70 psi and 9.0 SCFM @ 50 psi					
Port Sizes	gauge port 1/8" NPT					
	supply/output ports 1/4" NPT					
Weight	4.9 lbs.					

NOTES: ♦ - Split ranging allows position control using 3 to 9 psi or 9 to 15 psi as signal pressure

* - For 1/2 split range add 1.5% to these values

- Use clean, dry, oil free air

Recommended for air preparation: NAC 2030-N02 or NAC 2040-N02 filter, coalescer, regulator combination
Ref. catalog N5-G1 Modular type FRL Combination

Recommended for control of pilot signal: NIT 200 - OO 2G Electro-pneumatic regulator
Ref. catalog N8-01

HOW TO ORDER

IP300 — 42 0 ✳ — ✳ — ✳

Supply & Output Pressure Gauge ♦

† 00	no gauge
01	2kgf/cm²
02	3 kgf/cm²
03	10kgf/cm²
04	4 kgf/cm²
06	6kgf/cm²
11	30psi
12	45 psi
13	150 psi
22	200 kPa
23	300 kPa
24	400kPa
26	600 kPa
41	30 psi & 2 kgf/cm² stainless steel
† 42	60 psi & 4 kgf/cm² stainless steel
43	100 psi & 7 kgf/cm² stainless steel

Operation
† **0** Single Acting

Material
† **NIL** — NBR (Buna)
S — Copper Free External
T — FPM (Viton) High Temperature
L — SI (Silicone) Low Temperature

Port Connection
NIL — PT Thread
PF — Parallel Pipe Thread
† **NPT** — American National Standard Pipe Thread

Accessories
† **NIL** — Standard Lever Control Length (0.25 to 3.35 inches) (6 to 85mm)
D — High Pressure Signal Spring
K — 1/2 Split Range Spring
E — Longer Lever Control Length (2.35 to 4.33 inches) (60 to 110mm)
F — Longer Lever Control Length (4.13 to 5.91 inches) (105 to 150mm)

† Options 00, 42, 44, 0, 1, NPT, or NIL available for standard delivery. For all other options, allow extra delivery time.

SPECIFICATIONS

Unit acts as a 3-way or 4-way proportional position control valve (single or double acting)	
Supply Pressure	20 ~ 100 psi (1.4 ~ 7.0 kgf/cm²)
Signal Pressure -	3 ~ 15 psi (0.2 ~ 1.0 kgf/cm²)
Sensitivity	Less Than 0.3%
Linearity	Within ±2% FS.
Hysteresis	Less Than 1% FS.
Repeatability	Within ±0.5% FS.
Air Consumption (max.) Less Than	0.64 SCFM (18 Nl/min) at 70 psi (5 kgf/cm²) Supply
Output Flow Rate	8.8 SCFM (250 Nl/min) at 70 psi (5 kgf/cm²) Supply
Ambient Temperature and Temperature of Working Air	14° ~ 140°F (-10 ~ 60°C)
Range of Angular Adjustment	0°-90° CW or 0°-90° CCW (adjustable range 0°-60° to 0°-95°)
Port Size	1/4" (all ports)
Raw Material of Main Parts	Aluminum Die-cast, Stainless Steel, Brass, Nitrile Rubber
Weight	2.2 lbs. (1 kgf) Without Gauges
Dimension	4.9" x 3.6" x 3.2" (125mm x 92mm x 80mm) Without Gauge

NOTES - Use clean, dry, oil free air
Recommended for air preparation: NAC 2030-NO2 or NAC 2040-N02 filter, coalescer, regulator combination
Ref. catalog N5-G1 Modular type FRL combination
Recommended for control of pilot signal: NET200 - OO 2G Electro-pneumatic regulator
Ref. catalog N8-01

HOW TO ORDER

IP3100 — 0 1 0 ✳ — ✳

Travel Angle Indicator
0 not included
1 included

Thread Size
Nil Rc(pt) 1/4
N female 1/4 NPT

Accessories

Nil	No Accessories	
C	Long, Splined Shaft Fitting Assembly (21050-31)	
P	Short, Splined Shaft Fitting Assembly (P305010-20	
Option Pkgs.	Contents Of Option Package	QTY
Option W (Std.)	Gauge Adaptor (W) Straight Fitting	3
	Pressure Gauge G43-P2-NO1	1
	Pressure Gauge G43-P10-NO1	2
Option Y (Std.)	Gauge Adaptor (Y) Tee Fitting	3
	Pressure Gauge G43-P2-NO1	1
	Pressure Gauge G43-P10-NO1	2
Option S (St. Steel)	Gauge Adaptor (W) Straight Fitting	3
	Stainless Steel Pressure Gauge KS10B-SD2	1
	Stainless Steel Pressure Gauge KS10B-AD11	2
Option T (St. Steel)	Gauge Adaptor (Y) Tee Fitting	3
	Stainless Steel Pressure Gauge KS10B-SD2	1
	Stainless Steel Pressure Gauge KS10B-AD11	2

NOTE:
1. When more than 1 accessory is required, the letters should be listed in alphabetical order.
2. Accessories are packaged with the position controller, but are not mounted to it.
3. For further details of accessories, refer to "accessories" on page 6.

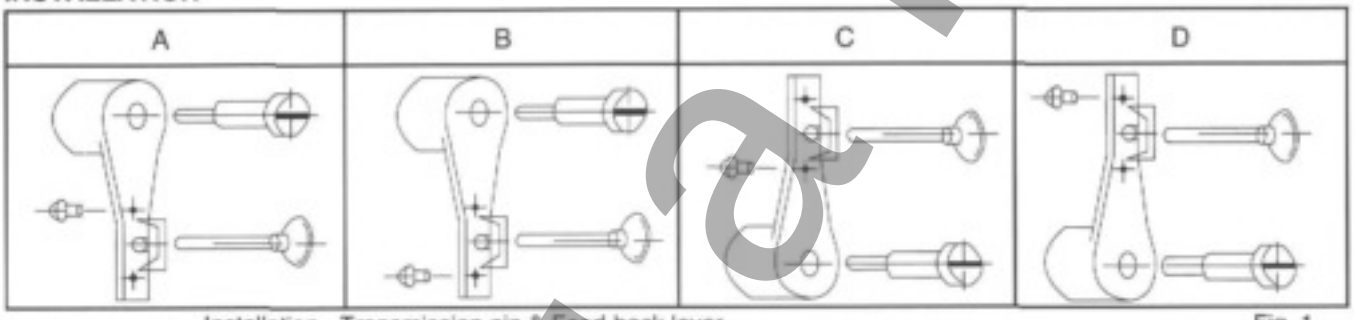
METHOD OF OPERATION

Signal pressure from a controlled pressure source enters the IP300 input chamber and exerts a force on the diaphragms. A pressure differential between the two diaphragms creates a force to open the pilot valve.

Output pressure passes through the pilot valve and the bypass valve, enters the process valve, or linear device to operate it. The movement of the linear actuator is converted into rotary movement by the positioner lever, and further transmitted to the internal feedback lever of the positioner through the transmission lever and pin.

Movement of the feedback lever varies the force of the feedback spring. The linear actuator moves on until the spring force balances with the force of the input chamber. Consequently the linear device is always controlled precisely in proportion to the signal pressure. Reconfiguring the operation mode, as well as the zero and span adjustments, are easy to do in the field.

INSTALLATION



Installation - Transmission pin & Feed-back lever

Fig. 1

SINGLE-ACTING ACTUATOR

OPERATION	ACTUATOR	SIGNAL PRESSURE / OUTPUT PRESSURE	SIGNAL RANGE	INSTALLATION STYLE (REF. FIG. 1)	OUT 1	OUT2
Direct		Increase / Increase	3-15 psi	A	used	plugged
			1/2 Split	D		
		Increase / Decrease	3-15 psi	C	plugged	used
			1/2 Split	B		
Reverse		Increase / Increase	3-15 psi	C	used	plugged
			1/2 Split	B		
		Increase / Decrease	3-15 psi	A	plugged	used
			1/2 Split	D		

Fig. 2

DOUBLE-ACTING ACTUATOR

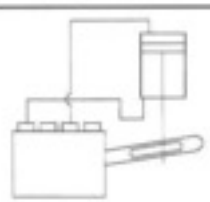
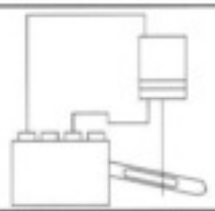
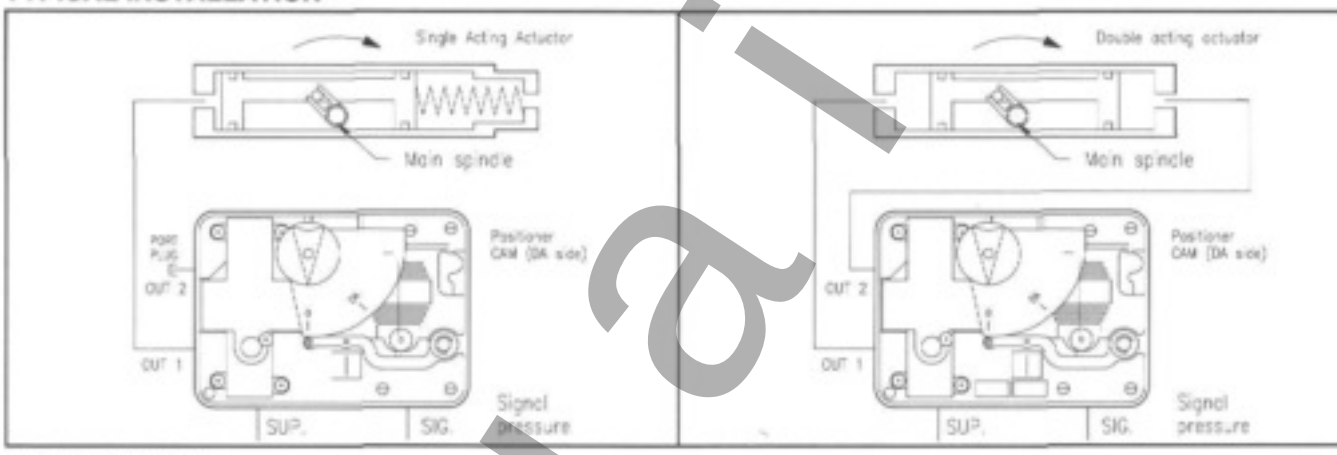
OPERATION	SIGNAL RANGE	INSTALLATION STYLE (REF. FIG. 1)	
Direct	3-15 psi	A	
	1/2 Split	D	
Reverse	3-15 psi	C	
	1/2 Split	B	

Fig. 3

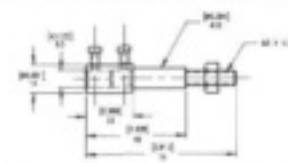
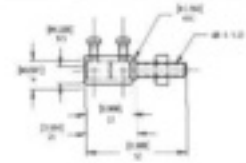
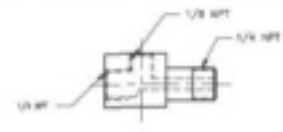
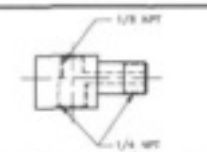
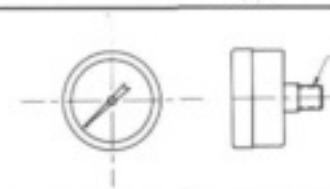
METHOD OF OPERATION

Signal pressure from a controlled pressure source enters the IP3100 positioner through the signal port. The difference in effective area within the bellows generates the power which causes a momentarily unbalanced condition to exist with respect to the exhaust valve to shift open the appropriate supply port. Supply pressure is therefore fed to OUT 1 port, and the actuator exhausts through the OUT 2 port, into the exhaust valve, and then out to the atmosphere. The result is that the actuator starts to move. This movement is transmitted back to the positioner via the directly connected feedback shaft which moves the feedback arm. As the feedback arm moves, it varies the force on the feedback spring and the actuator moves until the force of the spring and the force from the bellows attain equilibrium. Consequently, the rotary position always controlled precisely in proportion to the signal pressure. When the signal pressure is decreased, the exact inverse movement occurs.

TYPICAL INSTALLATION

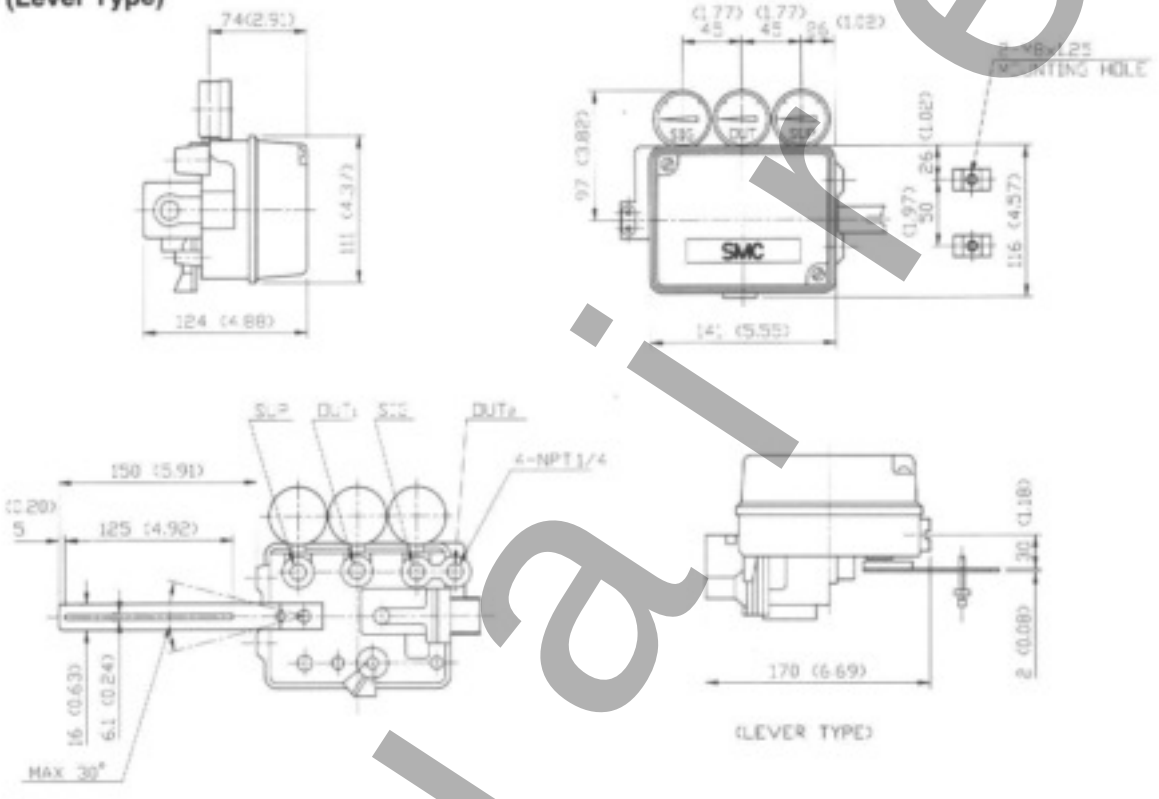


ACCESSORIES

Part Name	Part No.	Application	Dimensions (Inches)
Splined Shaft Fitting Assembly (long) (C)	210050-31	Connecting feedback shaft to main spindle of actuator. (also used for P610)	
Splined Shaft Fitting Assembly (short) (P)	P305010-20	Connecting feedback shaft to main spindle of actuator.	
Gauge Adaptor (W)	P30501056	NPT Run Tee fitting gauge installation (90°)	
Gauge Adaptor (Y)	P30501057	Branch Tee fitting gauge installation (90°)	
Pressure Gauge	G43-P2-N01 or KS10B-SD2 (St. Steel)	For SIG, pressure range 0-30psi, 1/8 NPT	
	G43-P10-N01 or KS10B-AD11 (St. Steel)	For OUT 1, OUT 2 pressure range 0-150 psi, 1/8 NPT	

DIMENSIONS

MODEL IP300 (Lever Type)



MODEL IP3100 (Rotary Type)