



**Please read this manual before installation and use.**

**GENERAL**

Lightweight and compact pneumatic actuator with PPS resin body.

Double-acting type

PND

Single-acting type

PSO (Airless SHUT)

PSC (Airless OPEN)

**PRODUCT CODE**

PND type	P N D	-	<input type="text"/>	-	<input type="text"/>	
PSO type	P S O	-	<input type="text"/>	-	<input type="text"/>	- <input type="text"/>
PSC type	P S C	-	<input type="text"/>	-	<input type="text"/>	- <input type="text"/>
	(1)		(2)		(3)	(4)

(1) Actuator	(2) Torque	(3) Option	(4) Positioner control pattern
PND	03S	FR : Filter Regulator	C : OPEN by 20 mA ↔ SHUT by 4 mA (Airless SHUT)
PSO	03D	LB : Limit Switch Box	D : OPEN by 4 mA ↔ SHUT by 20 mA (Airless SHUT)
PSC	04D	EX : Smart Positioner	E : SHUT by 4 mA ↔ OPEN by 20 mA (Airless OPEN)
	05D		T : SHUT by 20 mA ↔ OPEN by 4 mA (Airless OPEN)
	05W		

**PNEUMATIC ACTUATOR SPECIFICATIONS**

3 way valve: SHUT / Position①, OPEN / Position②

## PND type

Classification	Double-acting type			
Actuator type	PND-03S	PND-03D	PND-04D	PND-05D
Weight [kg]	0.2	0.3	0.5	0.8
Air consumption (round-trip) [ℓ]	0.05	0.08	0.19	0.35
Operation time [s]	Less than 1.			
Operation	SHUT by air to port A. ↔ OPEN by air to port B.			
Air pressure	0.4 to 0.7 MPa			
Piping connection	Rc 1/8			
Method of operation	Scotch yoke			
Housing material	PPS resin			
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)			
Manual operation	Operates the upper shaft of the actuator directly.			

## PSO PSC type

Classification	Single-acting type (Spring-return)				
Actuator type	PSO - 03S PSC - 03S	PSO - 03D PSC - 03D	PSO - 04D PSC - 04D	PSO - 05D PSC - 05D	PSO - 05W PSC - 05W
Weight [kg]	0.2	0.4	0.6	1.2	1.8
Air consumption (round-trip) [ℓ]	0.03	0.04	0.1	0.2	0.53
Air exit	One side	Both sides			
Operation time [s]	Less than 1.				
Operation	PSO : OPEN by air to intake port. ↔ SHUT by spring-return. (Airless SHUT) PSC : SHUT by air to intake port. ↔ OPEN by spring-return. (Airless OPEN)				
Air pressure	0.4 to 0.7 MPa				
Piping connection	Rc 1/8				
Method of operation	Scotch yoke				
Housing material	PPS resin				
Ambient temperature	-10 to 50 °C (Please be careful when you use in 5 °C or less, so that there no freeze.)				
Manual operation	No manual operation.				

**PNEUMATIC ACTUATOR SPECIFICATIONS**

3 way valve: SHUT / Position①, OPEN / Position②

## OPTIONAL PARTS

Classification		Code	PND	PSO	PSC	
FR Unit (Regulator with Filter) TA2-FR (KONAN)		FR	○	○	○	
Limit Switch Box (Standard load signal)		LB	○	○	○	
Speed Controller (with One-touch Fitting) One set		SE	○	○	○	
Speed Controller (with One-touch Fitting) Two sets		SS	○			
Speed Controller (with One-touch Fitting) Dual Speed Controller		SF		○	○	
Smart positioner for PSO / PSC (Except 03S)		EX		○	○	
Positioner operation	OPEN by 20 mA. ↔ SHUT by 4 mA. / spring-return. (Airless SHUT)	C		○		
	OPEN by 4 mA. ↔ SHUT by 20 mA. / spring-return. (Airless SHUT)	D		○		
(Input signal: 4 to 20 mA)	SHUT by 4 mA. ↔ OPEN by 20 mA. / spring-return. (Airless OPEN)	E			○	
	SHUT by 20 mA. ↔ OPEN by 4 mA. / spring-return. (Airless OPEN)	T			○	
5-Port Solenoid Valve (with speed controller, silencer, DIN connector)  VZ3190-□D-X213		Voltage: 100V AC	1S	○	○	○
		Voltage: 200V AC	2S	○	○	○
		Voltage: 110V AC	3S	○	○	○
		Voltage: 220V AC	4S	○	○	○
		Voltage: 24V DC	5S	○	○	○

## SOLENOID VALVE (Applicable Pneumatic Actuator: PND-05D)

Classification (□: Voltage code)			Code	
5-port Solenoid Valve Return (with bypass valve)	Lead wire	4N3S102K-L□	N43SL□	□: Voltage 1 : 100V AC 3 : 200V AC 5 : 24V DC
	DIN Connector	4N3S102K-D□	N43SD□	
	DIN Connector (with lamp)	4N3S102K-N□	N43SN□	
	Watertight cover	4N3S102K-W□	N43SW□	
5-port Explosion proof solenoid valve Return (with bypass valve)	Conduit	4N4S102K-E01-H□B0-R	4N4S01-□B0, NO	
	Flame proof packing (Cable size Φ9.5 to 10.4 mm)	4N4S102K-E10-H□B0-R	4N4S10-□B0, NO	

## Operate by solenoid valve (Normally Open)

PND	SHUT by solenoid off. ↔ OPEN by power to solenoid.
PSO	OPEN by power to solenoid. ↔ SHUT by solenoid off / spring-return. (Airless SHUT)
PSC	SHUT by power to solenoid. ↔ OPEN by solenoid off / spring-return. (Airless OPEN)

## INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

### HANDLING & STORAGE

#### ①HANDLING

Proper care in handling the actuator should be taken to prevent damage. Do not drop or throw it.

#### ②STORAGE

- Store the actuator in the protected area from dust, moisture, and direct sunlight.
- If possible, should be kept in the original packaging.
- Do not remove a dust proof cap until the piping.

#### ③CHECKING

Check the product code before installation.

### INSTALLATION

#### ①ENVIRONMENT

- Do not install in place where corrosive gas is present or where vibration is heavy (0.5 G or more).
- When radiant heat causes the surface temperature of the control unit to exceed 50 °C, provide an appropriate shielding plate.
- If there is a possibility that the fluid and drive part freeze, please take measures to prevent freezing.
- For single-acting type, prevent water and dust from coming into air exit.

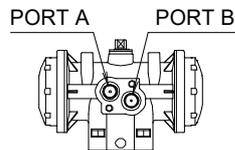
#### ②POSITIONING

Should be positioned through 90° upward from horizontal. Provide space around the product to allow manual operation, inspection and replacement work.

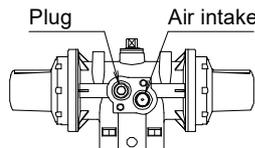
### AIR PIPING

- Pneumatic actuator has an air supply ports to operate piston.

Double-acting type  
PND : Rc 1/8  
Coupling OD  
less than 14.5 Φ



Single-acting type  
PSO, PSC : Rc 1/8



- Piping of double-acting type is connected by seal tape on PORT A / B. Piping of single-acting type is put seal tape only on the air intake port.
- PPS resin air supply port may be damaged if over tighten, please lightly tighten by hand.
- Never put anything on the actuator or make it into a foothold.

### OPERATION

#### ①AIR SOURCE

- Use the filtered dry air (less than 40 μ).
- Extra attention is needed where it's cold climate (below 5 °C).
- When air pressure is high, reduce it to standard pressure (0.4 to 0.7 MPa). Air pressure should not exceed 0.7 MPa during operation test.
- Capacity of compressor and air tank are to be calculated by capacity of piping and air consumption. A margin of 30 % is required.

#### ②TEST OPERATION

Check the operation of pneumatic actuator before fluid enters the piping.

Double-acting type	Stop the air from the air source. Release the residual pressure in the air cylinder. Open the air equalizer. Move the manual shaft of actuator with a wrench.
Single-acting type	Send the standard pressure air. Confirm the opening / closing operation by slowly moving the actuator.

#### ③TESTING

After piping, check following points.

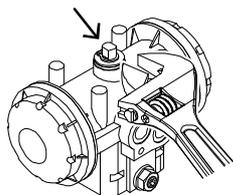
- Piping is correct.
- Air or fluid leakage from connection. Flow direction of air is correct.
- Air pressure is in the range.
- Nothing interferes with operation when limit switch or solenoid valve is attached.

**INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS****MANUAL OPERATION**

- Double-acting; stop the air supply and do not leave the air inside of cylinder.
- Single-acting; cannot be operated manually.
- Before automatic operation, be sure to remove wrench.

**OPERATION (PND)**

After turning air pressure to 0, turn manual shaft slowly with a smooth-jawed wrench to check the direction of OPEN/SHUT position.

**MAINTENANCE**

- Do the routine maintenance at least once in half a year.
- Do not set or take spring unit parts apart after installing the pneumatic single-acting actuator.

Can be used with no oil supply.

- Confirm the air leakage.
- Confirm the air supply pressure.
- Confirm the dirt or grit inside of cylinder.

**Inspection items**

- Confirm operation of opening and closing.
- Confirm whether screws are loose or not.
- Confirm the fluid temperature or pressure.
- Confirm the leak from valve stem.
- Confirm the bolt tightening torque.

**TROUBLESHOOTING**

Problem	Cause	Solution
Fail to operate.	Air doesn't come out.	Supply air.
	Air pressure is too low.	Adjust to standard pressure level.

For more information contact  
NIPPON VALVE CONTROLS, INC. for consultation.