

# NUTORK®

## Actuators & Valves



### SV Series Solenoid Valve



Standard Series



EX-PROOF Series



ATEX EX Series



Intrinsically Safe Series

# NUTORK CORPORATION

## Introduction

NUTORK SV series solenoid valve includes 5 types of valve body for option - SV100, SV200 direct-acting valve body and SV300, SV400, SV600 pilot-acting valve body. When equipped with different coils, for example standard waterproof coil, flame-proof coil, intrinsically safe coil or encapsulated explosion-proof coil, it can meet different requirements of normal working conditions and a variety of special working conditions, such as explosive atmosphere.

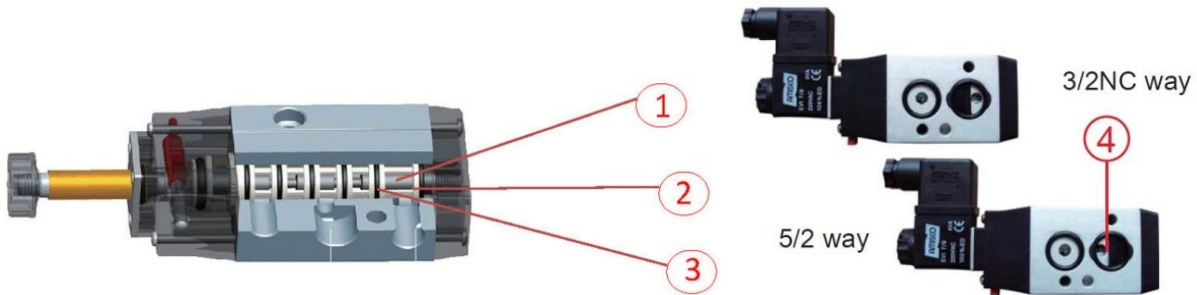
### Features:

1. Precision cartridge design of spool and seals.
2. Namur and in-line connection for option.
3. Screw-driver type manual-override available as standard.
4. Low power consumption, single/dual (mono/bi-stable) coils optional for pilot operated solenoid valve.
5. 3/2 NC & 5/2 way convertible for single acting spring return and double acting pneumatic actuators.
6. Hard anodised Aluminium Alloy or Stainless Steel body for different applications.
7. PA, Aluminum Alloy or Stainless Steel coil with DIN or M20\*1.5 cable entry.
8. Standard working temperature of -25 °C to +80 °C.



Special request for high temperature +150°C and low temperature -40°C applications also available.

## Advantages of Nutork solenoid valve



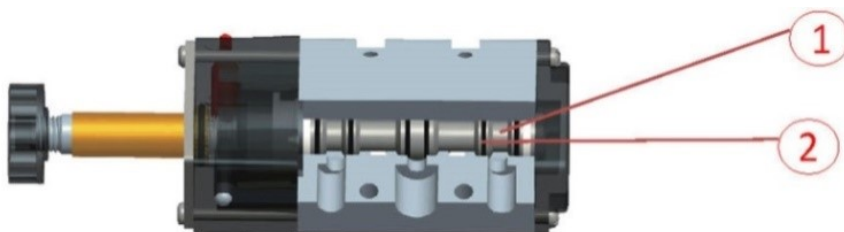
### Static O-ring sealing

### 3/2 (NC) & 5/2 convertible O-ring

1. High strength 7050 aviation aluminum-alloy spool
2. High-quality Nylon66 sleeve
3. Static O-ring sealing (fixed on the sleeve to avoid scraping or abrasion from particles in the instrument gas)
4. Patented 3/2 (NC) & 5/2 convertible O-ring

Nutork solenoid spool valve is of static sealing, the spool move inside of the sleeve, the O-rings are installed on the sleeve instead of the spool, thus to avoid scraping or abrasion from particles in the instrument gas, which extends its service life significantly.

### Traditional solenoid valve



### Traditional dynamic sealing solenoid valve

1. General aluminum alloy
2. O-rings are installed on the spool, worn out when moving with the spool, and can be easily damaged by particles in the instrument air, which lead to leakage and malfunction. This is the main reason for most problems occurred to solenoid valve.

## About air ports

Port 1 is the inlet port, ports 5 and 3 are exhaust ports

which can be fitted with silencers or speed controls

valves (to control the speed of actuations).

Ports 2 and 4 are the outlet ports connected to the

actuator input ports (ports A and B). When instrument gas

is supplied and exhausted from different actuator ports,

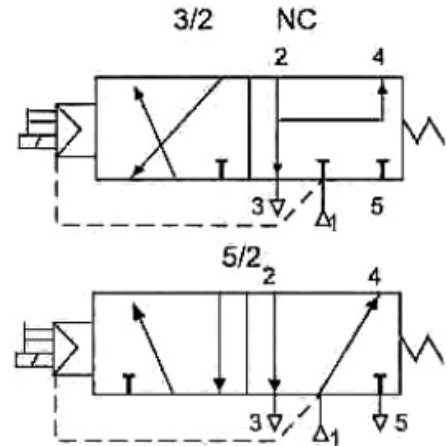
the pistons of the actuator will be forced outside or returned to original position accordingly.

NUTORK NAMUR solenoid valves are normally closed as standard (on request can be

supplied as normally opening). This means that the solenoid valve will direct the flow of

supply air to port B of actuator and return the pistons of actuator to the closed position

when the coil is de-energized in the standard assembly.



## Coil De-energized

When the coil is de-energized, the spring on the

plunger will return the plunger to its seat, blocking

internal pilot air and open the vent port. The vent

port will allow the air on the piston to escape, and

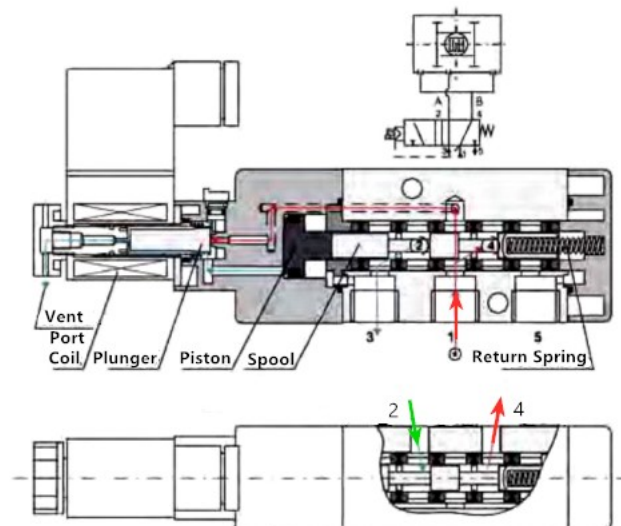
the return spring will return the spool to its normal

position. In this position, the spool directs flow of supply air from inlet port 1 to outlet port 4 while

outlet port 2 is connected to exhaust port 3. For the standard assembly, the outlet port 4 is

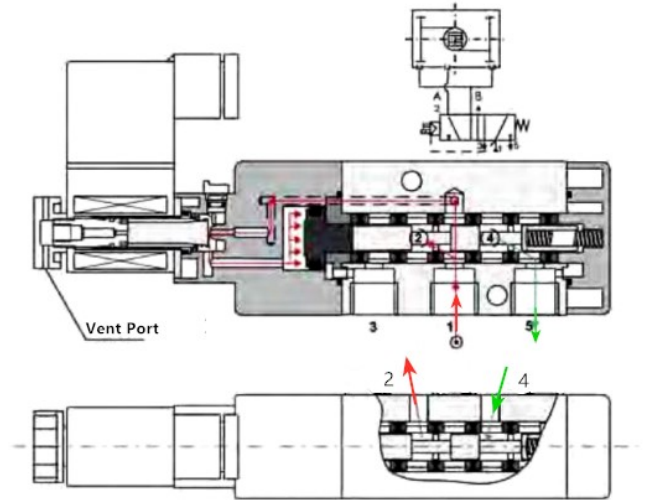
connected with port B of actuator. The air from outlet port 4 will return the pistons of

actuator to closed position when there is no electric power on the coil.



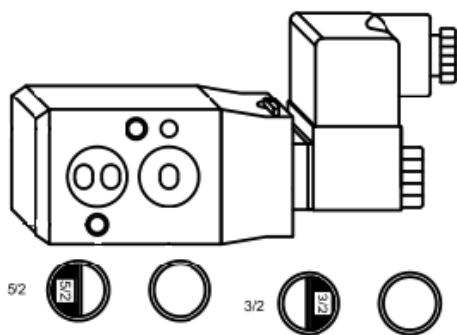
## Coil Energized

When the coil is energized, the solenoid coil creates a magnetic field surrounding the plunger assembly and plunger. The plunger is lifted off its seat by this magnetic force and the air supplied provides an internal pilot pressure that is directed to the piston which shifts the spool and compress the return spring. This shifting directs the flow of supply air from inlet port 1 to outlet port 2 while outlet port 4 is connected to exhaust port 5. For the standard assembly, the outlet port 2 is connected with port A of actuator. Then the air from outlet port 2 will move the pistons of actuator to opening position when the coil is energized.



## Installation

Prior installing the solenoid valve, depressurize the pipes and clean them internally to avoid particles entering the system (tape sealant, thread compound). The installation dimensions of the NUTORK plate-mounted solenoid valve fully comply with the NAMUR standard and can be directly installed on the solenoid valve NAMUR mounting surface of the pneumatic actuator.



3/2 (NC) & 5/2 convertible O-ring



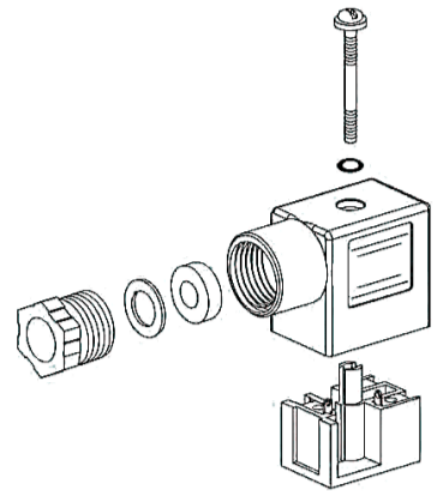
Namur mounting

First, place the O-ring to set the solenoid valve to 3/2 NC or 5/2 according to the type of the actuator, then install the solenoid valve onto the pneumatic actuator with the M5 mounting screws provided.

For standard assembly, the inlet port A is on the left side of the actuator, when the instrument gas enters the pneumatic actuator from port A, the pistons of actuator will be forced outwards. The port A can also be customized at right side, when the instrument gas enters the pneumatic actuator from it, the pistons of actuator are forced outwards. This is a special assembly and should be noted when place an order.

## Electrical connection

- 1) Electrical connection must be made by qualified personnel and according to applicable local standards and regulations.
- 2) Before any electrical connection, turn off the electrical current to power off the components.
- 3) There are signs for '+' and '-' terminals on the junction box.
- 4) Depending on the voltage, electrical components must be grounded according to local standards and regulations.
- 5) Installing the connector box, please pay attention on the O ring which offers environmental protection against the ingress of liquids, dusts or other foreign matter.



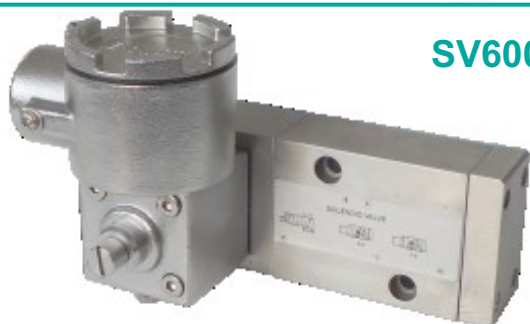
## Spool Valve Performance Data

Model No.	SV100	SV200	SV300	SV400	SV600
Body and Fluid Contact Materials	Anodized Aluminum and NBR	Stainless Steel 316 and NBR	Anodized Aluminum, Glass-filled PA and NBR	Anodized Aluminum, Glass-filled PA, and NBR	Stainless Steel 316, Glass-filled PA, POM and NBR
Function	3/2 Direct Acting, Spring Return, NC		5/2 or 3/2 NC		5/2 and 3/2 NC
Air Ports	1/4" BSP or NPT		1/4" BSP or NPT	1/2" BSP or NPT	1/4" BSP or NPT
Mounting	Namur Mounting or In-line				
Manual Override	As standard				
Working Temperature	-25 ~75 ,(option:-55 ~75 )				
Working Pressure	2-10 Bar				
Working Medium	Filtered Dry Air or Inert Gas 40 micron or better				
CV Value	0.08		0.6	2.4	0.6
Working Life	Minimum 1 Million				
Max Frequency of Operatin	8 Cycle/Sec		5 Cycle/Sec		



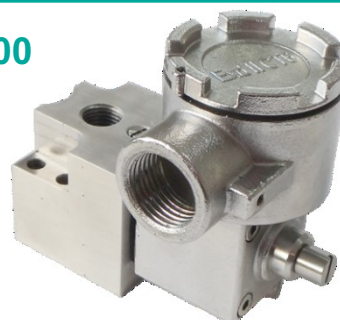
SV300

SV100



SV600

SV200



## Coil Performance Data

Coil Code	C0	C0.1	C4	C4.1	C5	C5.1	C7	C7.1	
Name	Standard Coil		Stainless Steel Enclosure Coil		Aluminum Alloy Enclosure Coil		Encapsulation Coil		
Voltage	12/24/48VDC 24/110/220VAC	12/24/48VDC 24/110/220VAC	24VDC 110/220VAC	24VDC	24VDC 110/220VAC	24VDC	24VDC 220VAC	24VDC 110/220VAC	
Power Consumption	3W@DC 4.2~5VA@AC		2.5W@DC 3.8VA@AC	0.5W	2.5W@DC 3.8VA@AC	0.5W	2.6W@DC 2.5VA@AC	4.5~5.5W@DC 6.5~7.5VA@AC	
Voltage Tolerance	±10%								
Duty Cycle	100%								
Wiring Connection	DIN Plug	1/2"NPT(F) with 0.6M Lead Wire	1/2"NPT(F) or M20×1.5 Electric Entry				3M Lead Wire	1/2"NPT(F) with 0.6M Lead Wire	
Insulation Protection	F Class Coil		H Class Coil						
Operating Temperature	-20°C~50°C	-20°C~50°C	-25°C~75°C (Option: -55°C~75°C )				-20°C~50°C	-20°C~60°C	
Weather Protection	IP65 NEMA 4 & 4X		IP67 NEMA 6				IP65 NEMA 4 & 4X		
Hazardous Area	-	-	ExdIICT6	ExialICT6	ExdIICT6	ExialICT6	ExmIIT6	ExmIIT4	
Approval	-	-	ATEX				IEC/ATEX	FM/CSA	
Brand	AMISCO		NUTORK				NASS	NUTORK	

**Note: Low Power Consumption 0.5W options are not available for SV110 & SV210**

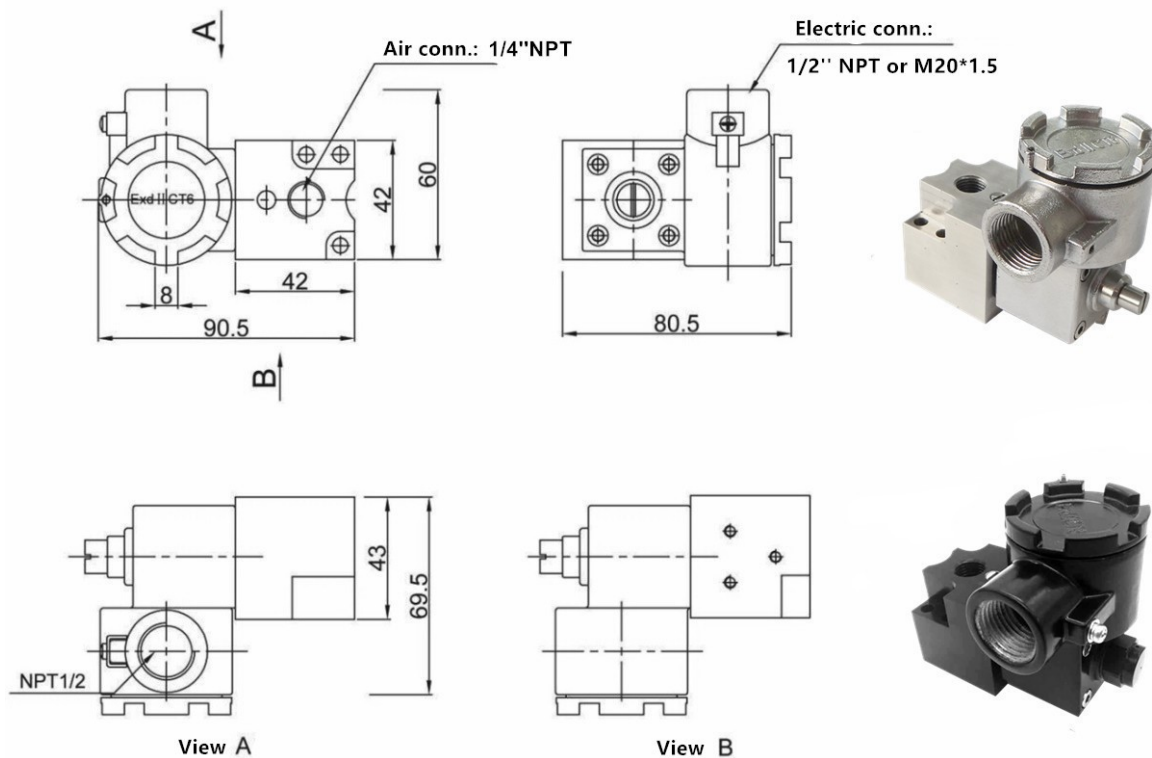
## Coil Material Specification

Coil Code	C0	C0.1	C4	C4.1	C5	C5.1	C7	C7.1
Coil Case	PA		316SS		Aluminum Alloy+Epoxy Coated		PA	
Armature and Fixed Pole Piece	Magnetic Solenoid Quality Stainless Steel							
Springs	Stainless Steel							
Seals and Seats	NBR(Standard), HNBR(Optional)							
Coil Former	30% Glas-filled Nylon66							
Magnetic Coil	Class F Coated Copper		Class H Coated Copper					



## SV100(Alu. Alloy)/200(316SS) + C5(Alu. Alloy)/C4(316SS) Direct Acting Solenoid Valve

- ※ Hard anodized aluminum alloy and stainless steel valve body/coil to meet requirements of different applications
- ※ Direct acting 3/2 NC
- ※ Namur standard connection and in-line connection
- ※ Stainless steel material for corrosive applications, explosive-proof grade - EExdIICT6 or EExialICT6 (ATEX certified) for explosive applications
- ※ With manual override



## Integral mounted solenoid valve + air operated valve (Max. air port of 1")

- ※ Combination of direct acting solenoid valve and air operated valve to realize rapid opening of pneumatic actuator.



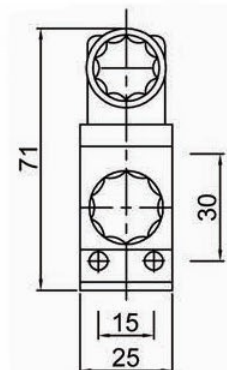
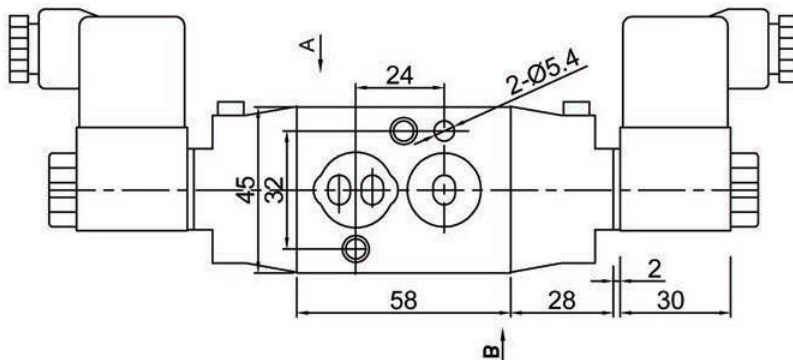
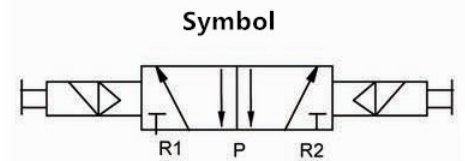
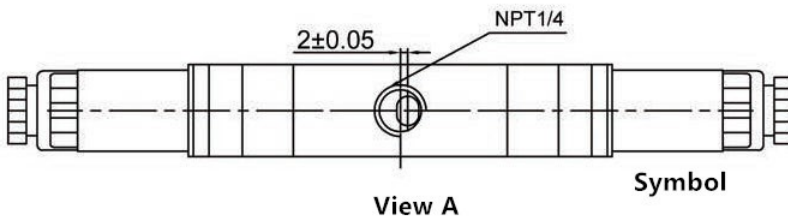
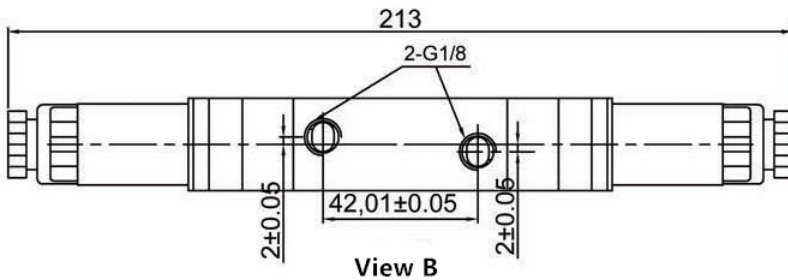
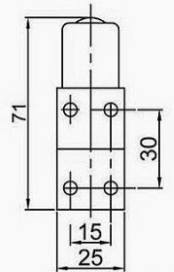
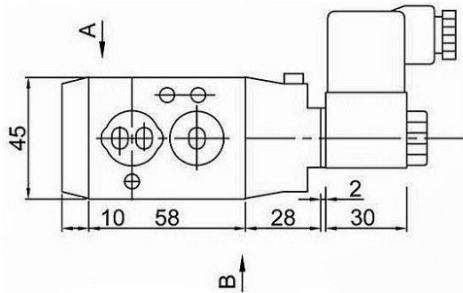
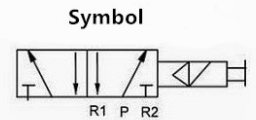
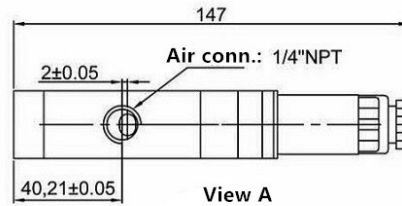
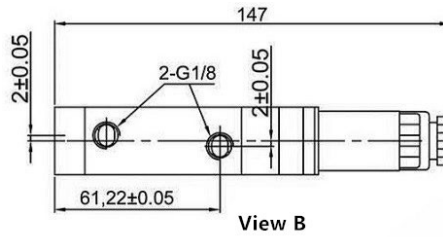
Aluminum Alloy



316SS

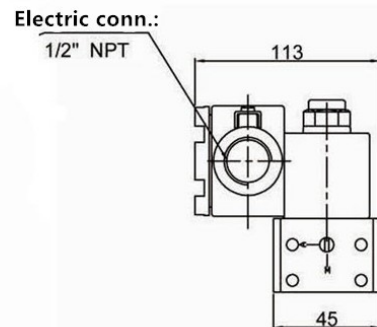
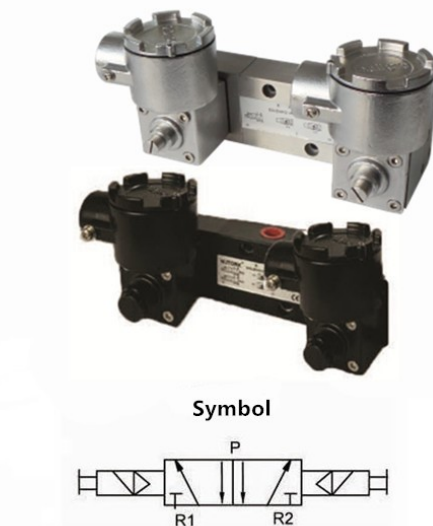
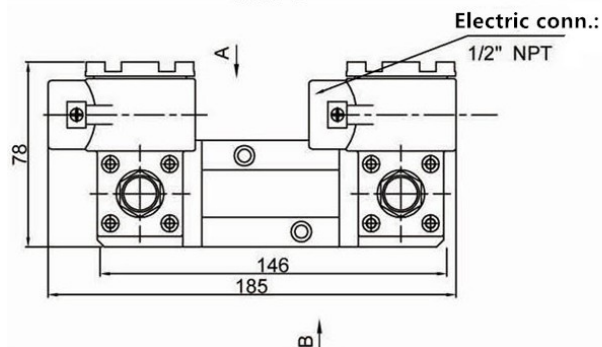
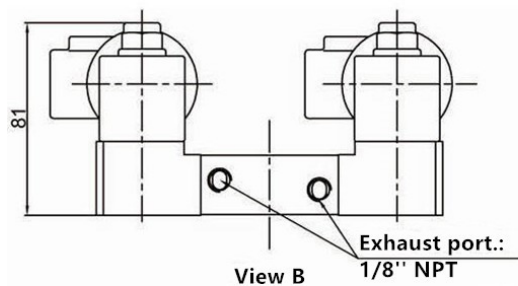
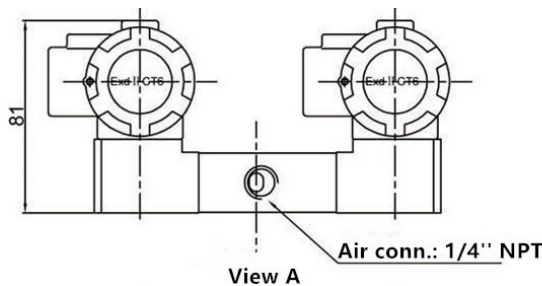
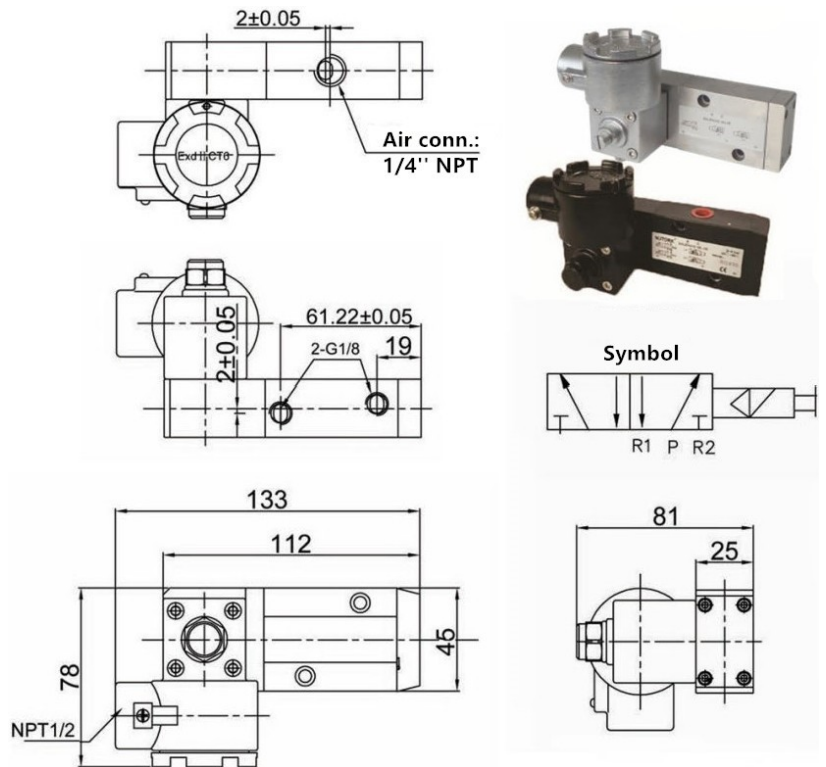
## SV300 + C0/C6/C7 Pilot Acting Solenoid Valve

- ※ 3/2 NC & 5/2 way convertible for single acting spring return and double acting pneumatic actuators
- ※ With manual override
- ※ Single/dual (mono/bi-stable) coils
- ※ Equipped with standard waterproof coil, flame-proof coil, intrinsically safe coil or encapsulated explosion-proof coil to meet different requirements of normal working conditions and a variety of special working conditions, such as explosive atmosphere
- ※ Good sealing performance to prevent ingress of liquid, dust or other foreign matter

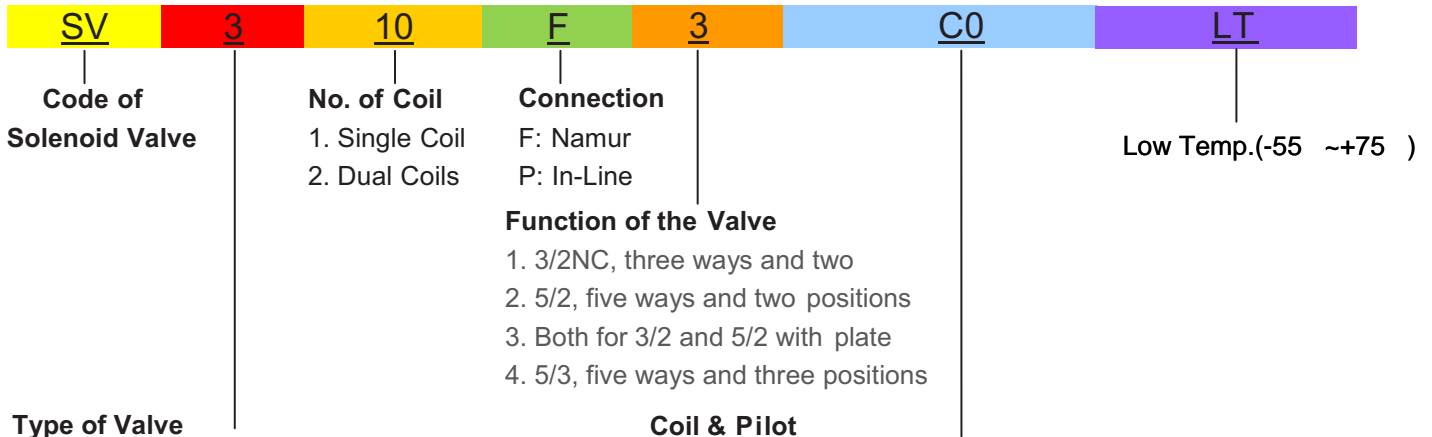


## SV300(Alu. Alloy)/SV600(316SS) + C5(Alu. Alloy)/C4(316SS) Pilot Acting Solenoid Valve

- ※ Low power consumption
- ※ With manual override
- ※ Single/dual (mono/bi-stable) coils
- ※ 3/2 NC & 5/2 way convertible for single acting spring return and double acting pneumatic actuators
- ※ Equipped with standard waterproof coil, flame-proof coil, intrinsically safe coil or encapsulated explosion-proof coil to meet different requirements of normal working conditions and a variety of special working conditions, such as explosive atmosphere
- ※ Good sealing performance to prevent ingress of liquid, dust or other foreign matter



## Ordering Instruction



1. Code 1: Anodized Aluminum, Direct operated valve (1/8" or 1/4" Ports)
2. Code 2: AISI316, Direct Operated valve (1/8" or 1/4" Ports)
3. Code 3: Anodized Aluminum Pilot Operated Spool Valve (1/4" Ports)
4. Code 4: Anodized Aluminum Pilot Operated Spool Valve (1/2" Ports)
5. Code 6: AISI316 Pilot Operated Spool Valve (1/4" Ports)
6. Code VSII: Polyamide Body Pilot Operated Piston Valve (1/4" ports)

C0	Encapsulation coil with DIN plug terminal box, power-12VDC, 24VDC/AC, 48VDC, 120/240VAC, IP65 (NEMA4 & 4X)
C0.1	Encapsulation coil c/w 1/2"NPT(F) with 0.6M lead wire, power - 12VDC, 24VDC/AC, 48VDC, 120/ 240VAC, IP65 (NEMA4 & 4X)
C4	Stainless steel enclosure coil, 1/2"NPT(F) or M20x1.5 electric entry Voltage - 24VDC, 110/ 220VAC, <b>Power consumption:2.5W@24VDC</b> IP67 & EExdIICT6 (ATEX Approval)
C4.1	<b>Low Power Consumption: 0.5W</b> , Stainless steel enclosure coil, 1/2"NPT(F) or M20x1.5 electric entry, power - 24VDC, IP67 & EExialICT6 (ATEX Approval)
C5	Aluminum enclosure coil, 1/2"NPT(F) or M20x1.5 electric entry Voltage - 24VDC, 110/ 220VAC, <b>Power consumption:2.5W@24VDC</b> IP67 & EExdIICT6 (ATEX Approval)
C5.1	<b>Low Power Consumption: 0.5W</b> , Aluminum enclosure coil, 1/2"NPT (F) or M20x1.5 electric entry, Voltage- 24VDC, IP67 & EExialICT6 (ATEX Approval)
C6	Encapsulation coil with DIN plug terminal box, power -24VDC, IP65 (NEMA4 & 4X) & EExialICT6 (IEC/ ATEX/ FM/CSA)
C6.1	Encapsulation coil with 1/2"NPT electric entry, power - 24VDC, IP65 (NEMA4 & 4X) & EExialICT6 (IEC/ATEX/FM/CSA)
C7	Encapsulation coil with 3M lead wire, power-24VDC, 230VAC, IP65 (NEMA4 & 4X) & EExmIIT6 (IEC/ ATEX)
C7.1	Encapsulation coil c/w 1/2"NPT(F) 0.6M lead wire, power -12/ 24VDC, 120/240VAC, IP65 (NEMA4 & 4X) & EExmIIT4(CSA/FM)

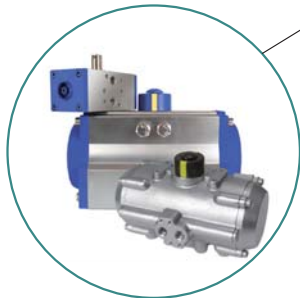
**Note:**

1. VSII is only available in Namur mounting.

**Note:**

1. C4 /C4.1& C5/C5.1 coils are not available for VSII.
2. Low Power Consumption (0.5W) options are not available for SV110 & SV210.
3. LT - Low temperature application up to -55 .

**NUTORK CORP.** manufactures a wide range of pneumatic actuators, electric actuators and the accessories of pneumatic actuator (limit switchbox, solenoid valve, manual override ---etc.) for quarter turn valves



Rack & Pinion Type Pneumatic Actuator.  
(Certificated by CE-ATEX/SIL3)  
Max. Output Torque: 9340Nm

Scotch Yoke Type Pneumatic & Hydraulic Actuator.  
(Certificated by CE-ATEX/SIL3)  
Max. Output Torque 293800Nm



NTQ Series Electric Actuator  
IP67/IP68(30M@24hrs)Enclosure & EExdIIBT6  
Max. Output Torque 6000Nm  
Approved by SIL3/IP68/MD/LVD/EMC.

NTE Series Electric Actuator  
IP67/IP68(30M@24hrs)  
EnclosureMax. Output Torque 6000Nm  
Approved by SIL3/IP68/MD/LVD/EMC.



Limit Switchbox IP67/IP68(50M@72hrs)  
Enclosure & EExdIIBT6/EEExdIICT6

Solenoid Valve 3/2NC & 5/2 Way, Static O-ring Sealing Design.  
Aluminum & 316SS Body  
IP67 & EExdIIBT6/EEExdIICT6



Air Filter Regulator Aluminum Body with Vinyl Paint & 316SS Body.  
Size: 1/4" ~ 1"

Manual Override Aluminum & Cast Iron & Ductile Iron Body  
Max Output Torque 70000Nm



Ball valve (Floating ball design),  
We can provide different pressure rating/ connection type/ operation mode.

Concentric Soft Seated Butterfly Valve  
High Performance Double Eccentric Butterfly Valve  
High Performance Triple Offset Metal Seated Butterfly Valve  
We can provide different pressure rating/ connection type/ operation mode.

