

NUTORK®

Actuators & Valves



SOLENOID VALVES & CONTROLLER



NEMA 4,4X

NUTORK CORPORATION

Introduction

The New NUTORK Controls Range of SV Series Solenoid Spool and Direct Acting valves are now available for all Atex Hazardous and Safe Area's Namur Standard in types 500 and 600 Solenoid spool valves with Precision Cartridge design of spool and seals, in 3/2 Way Normally closed and 5/2 suitable operating for Spring Return and Double Acting pneumatic actuators. Also in the range are 1/4" Multi-Mount (A Combined Namur and Threaded connection on same base) direct acting solenoid Valves. Completing the range are Inline Solenoid spool valves with the same Precision Cartridge design of spool and seals.



Available as standard with screw-driver type manual-override.

Special order option without manual-override.

SV Series Valves produced in Hard Anodised Aluminium or Stainless Steel body variations, with coils in Din or Wired Terminal Enclosure in Aluminium or Stainless Steel with M20 x 1.5 cable entry.

Features

- ✳ Offer excellent environmental protection against the ingress of liquids, dust or other foreign matter.
- ✳ Suitable for use of 3/2 NC or 5/2 functions to control double-acting and single-acting pneumatic actuators.
- ✳ Suitable for pilot operated with single/dual (mono/bi-stable) coils and low watt miniature pilot valve.
- ✳ Suitable for use of standard coil or various flame-proof and intrinsically safe coils certified for use in all hazardous areas (Class I, Div. 1&2, Group A, B, C and D, Eex d IICT6, Eex ia CT6 and Eex mb II T4 or T5).
- ✳ Standard Working Temperature range of -25°C to +80°C.
- ✳ On Special Request Suitable for use in high temperature +150°C and low cold temperature -40°C applications.

About air ports

Port 1 is the inlet supply port, with ports 5 and 3 the exhaust ports, these may 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) to extend and return the pistons of the actuator. 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.

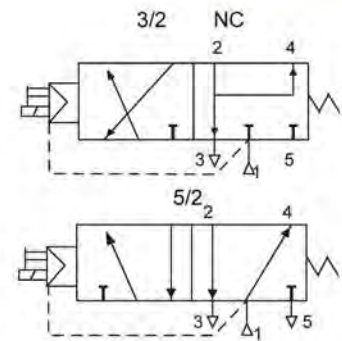


Fig.1 Air Ports

Coil De-energized

In Fig.2, we can find that when the coil is de-energized, a spring on the plunger will return the plunger to its seat, blocking internal pilot air, and open a vent port. This 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. As 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 without electric power on the coil.

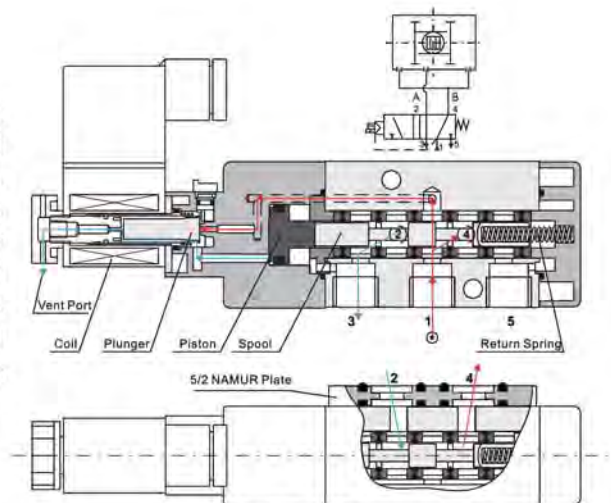


Fig.2 Coil de-energized

Coil Energized

In Fig.3, we can find that 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 supply air 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. As for the standard assembly, the outlet port 2 is connected with port A of actuator. The air from outlet port 2 will move the pistons of actuator to opening position when the coil is energized.

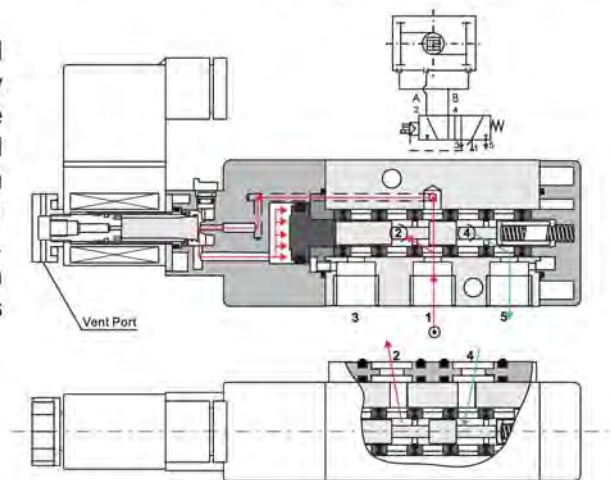
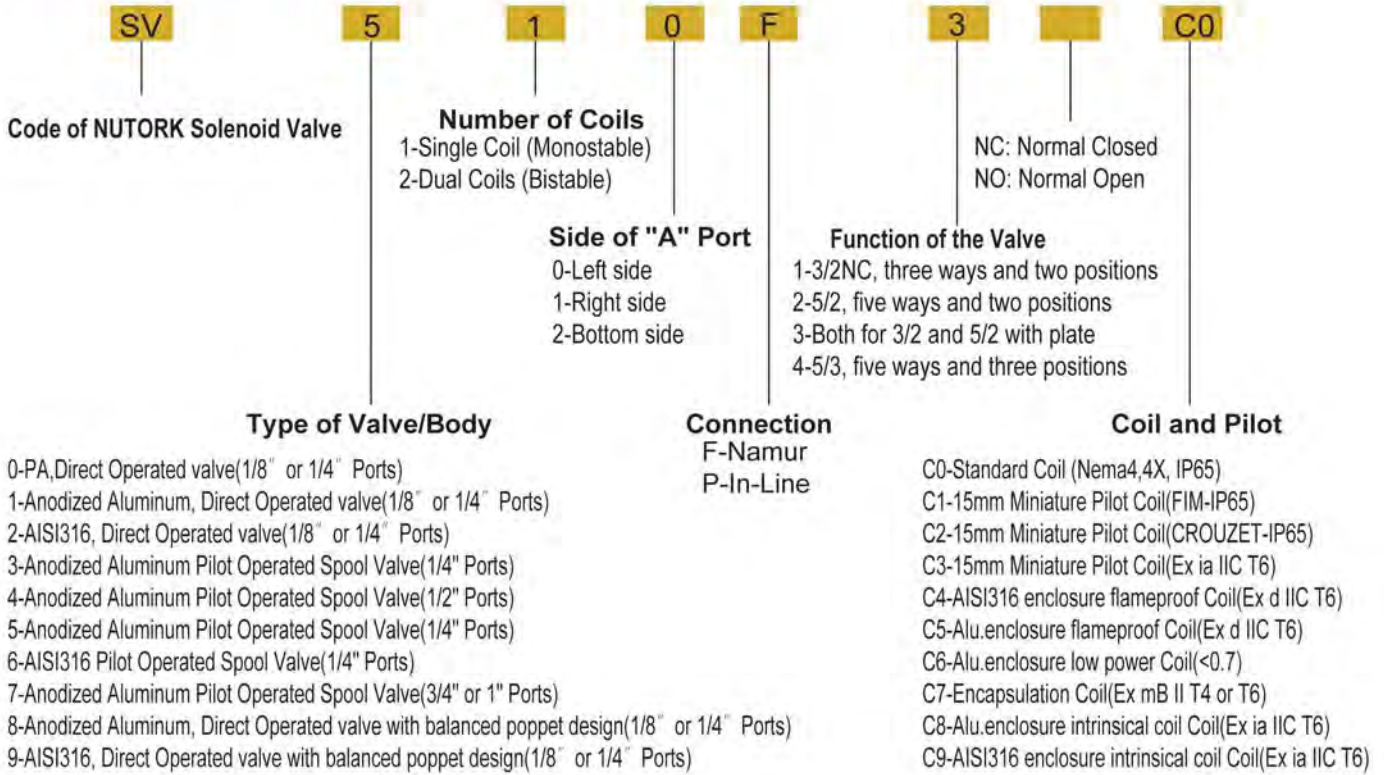


Fig.3 Coil energized

NAMUR Interface Plates

As for NUTORK NAMUR solenoid valve of SV500/600/700, the same spool valve equipped with 3/2 and 5/2 function NAMUR interface plates can be adapted for 3/2 NC or 5/2 functions to control double-acting and single-acting actuators.

Ordering Guide



Extreme Hazardous Area Application



All 316 Stainless Steel Solution For Offshore Application



Flameproof Solution For Hazardous Area Application

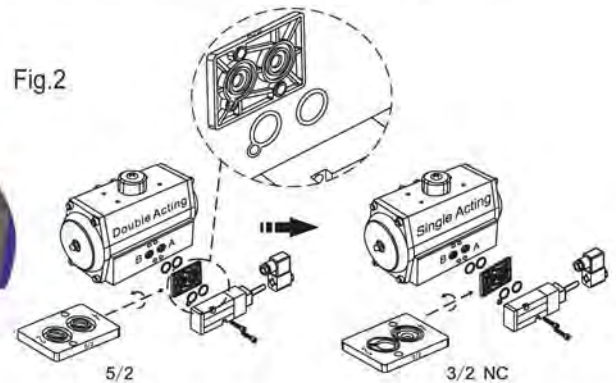
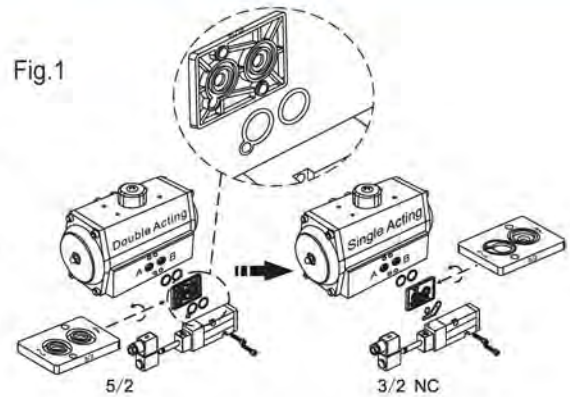
Assembly on the Actuator

Prior installing the solenoid valve, depressurize the pipes and clean them internally to avoid particles entering the system (tape sealant, thread compound). The valves may be mounted on the NAMUR interface of the pneumatic actuator.

The dimension design of the NUTORK spool valve is exactly in light of NAMUR standard. The same spool valve equips with 3/2 and 5/2 function NAMUR interface plates. According to the direction of the interface plate, Fix the spool valve and the interface plate on the NAMUR interface of the pneumatic actuator with 2 screw M5 (Torque 4 to 5 Nm) provided.

In assembly Fig.1, the inlet port A of the actuator is in left side which forces the pistons of actuator outwards under pressure air. This is standard assembly.

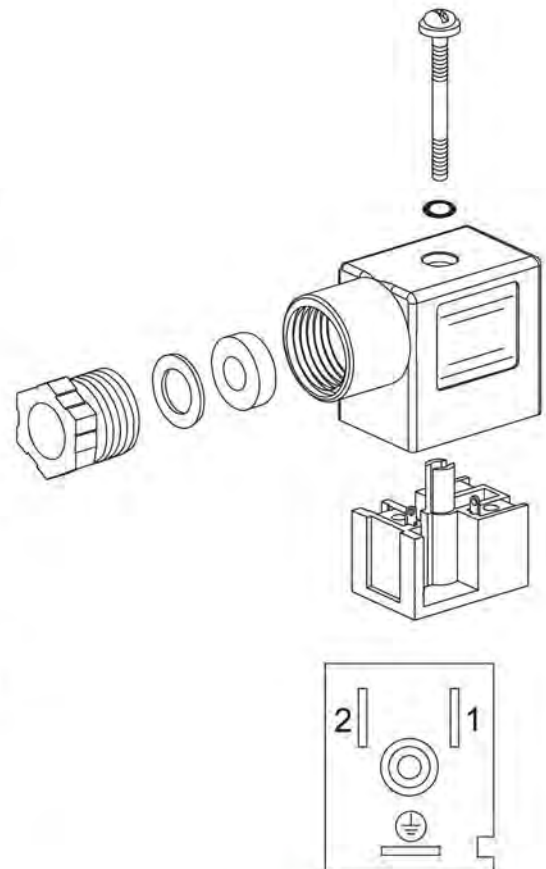
In assembly Fig.2, the inlet port A of the actuator is in right side which forces the pistons of actuator outwards under pressure air. This is a special assembly and should be noted when making order form.







Electrical connection

General recommendation

- ※ Electrical connection must be made by qualified personnel and according to applicable local standards and regulations.
- ※ Before any electrical connection, turn off the electrical current to power off the components
- ※ Depending on the voltage, electrical components must be grounded according to local standards and regulations.
- ※ Standard coils
- ※ Electrical connection is made with detachable plug connector for cable dia.6-8mm (see fig.), rotatable by 180° increments (3 pins: 1,2 electric pins+PE).
- ※ 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.
- ※ Explosion proof coils
See particular instructions sheet delivered with those coils.



Spool Valve Performance Data

Model.No	SV000	SV100	SV200	SV300	SV400	SV500	SV600
Body and Fluid Contact Materials	PA Stainless Steel 316 and NBR	Anodized Aluminum and NBR	Stainless Steel 316 and NBR	Anodized Aluminum, Glass-filled PA and NBR	Anodized Aluminum, Glass-filled PA and NBR	Anodized Aluminum, Glass-filled PA POM 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	1/8" or 1/4" BSPP or NPT			1/4" BSPP or NPT	1/2" BSPP or NPT	1/4" BSPP or NPT	
Mounting	Namur and threaded connections			Namur Mounting or In-Line			
Manual Override	As Standard						
Working Temperature	-25°C~80°C			-5°C~80°C	-5°C~80°C	-25°C~80°C On request under the 500/600 -40°C~80°C	
Working Pressure	0~8 bar			2~8 bar			
Working Medium	Filtered Dry air or Inert Gas 40 micron or better						
The Orifice Size for body	Φ1.3mm			Φ 5.64mm	Φ 7.98mm	Φ 5mm	Φ 5mm
The Orifice Size for exhaust	Φ1.3mm			Φ 5.64mm	Φ 7.98mm	Φ 5mm	Φ 5mm
Working Life	Minimum 1 Million						
Max Frequency of Operation	8Cycle/Sec			5 Cycle/Sec			
Photo							



Coils and Pilot Coils Performance Data

Model No	C0	C1	C2	C3	C4	C5	C6	C7	
Name	Standard Coil	15mm Miniature Pilot Coil	15mm Miniature Pilot Coil	15mm Miniature Pilot Coil	Stainless steel Enclosure Coil	Aluminium Enclosure Coil	Aluminium Enclosure Coil	Encapsulation Coil	
Voltage Wattage /Power Consumption	12VDC-4 W 24VDC-4 W 48VDC-4 W	24VAC-4VA (50/60Hz) 110VAC-4VA (50/60Hz) 24VDC-2.3W 24VDC-2.3W	12VDC-2.3W 24VDC-2.3W	110VAC-2.5VA (50/60Hz) 220VAC-2.5VA (50/60Hz)	24VDC-1W	24VDC-0.7W	24VDC-3.5W 24VDC-3.5W	24VDC-W	24VDC-3W 110VAC-4VA (50/60Hz) 220VAC-4VA (50/60Hz)
Voltage tolerance	±10%								
Duty Cycle	100%								
Wiring Connection	C/W Din Plug(6~8mm)	C/W Din Plug(4~6mm)			M20x1.5 Terminal Strips		Flying leads		
Insulation Protection	F Class Coil							H Class Coil	
Operating Temperature	-50°C~150°C	-5°C~50°C	-5°C~50°C	-10°C~50°C	-20°C~60°C On requires: -40°C~80°C		-25°C~65°C		
Weather Protection	IP65 NEMA4, 4X	IP65	IP65	IP65	IP66	IP66	IP66	IP65	
Hazardous Area	-	-	-	Eex ia IICT6	Eex d IICT6	Eex d IICT6	-	Eex mb IIT4 or T5	
Approval	CE, NEMA 4, 4X	CE	CE UL cUL	CE UL cUL	CE Ex ATEX	CE Ex ATEX	CE	CE Ex ATEX	
Photo									

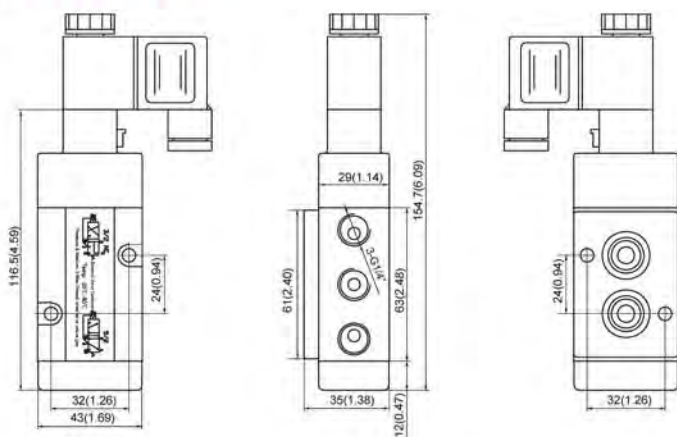
Coil Material Specification

Model No	C0	C1	C2	C3	C4	C5	C6	C7
Coil Case	PA			Stainless Steel 316		Aluminium + Epoxy Coated		PA
Armature and Fixed Pole Piece	Magnetic Solenoid Quality Stainless Steel							
Springs	Stainless Steel							
Seals and Seats	NBR/HNBR							
Coil Former	30% glass filled Nylon66							
Magnetic Wire	Class F Coated Copper							Class H Coated Copper

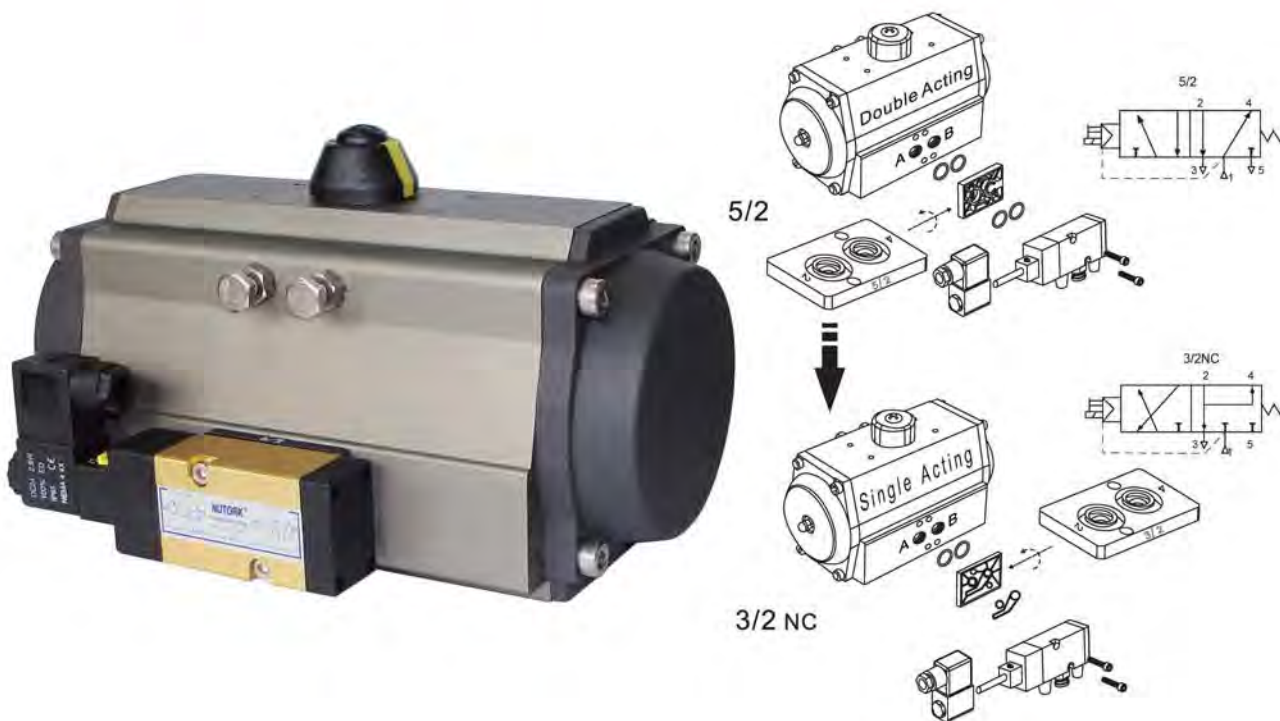
SV510F3C0/C7 Mono-stable Solenoid Valve

- ✱ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators. Manual override on the pilot body.
- ✱ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ✱ The same spool valve can be fitted with IP65 NEMA4, 4X coil (C0) or with Ex mb II T4 or T5 coil (C7).

Dimensions



Assembly and Mounting (According to Namur VDI/VDE 3845)

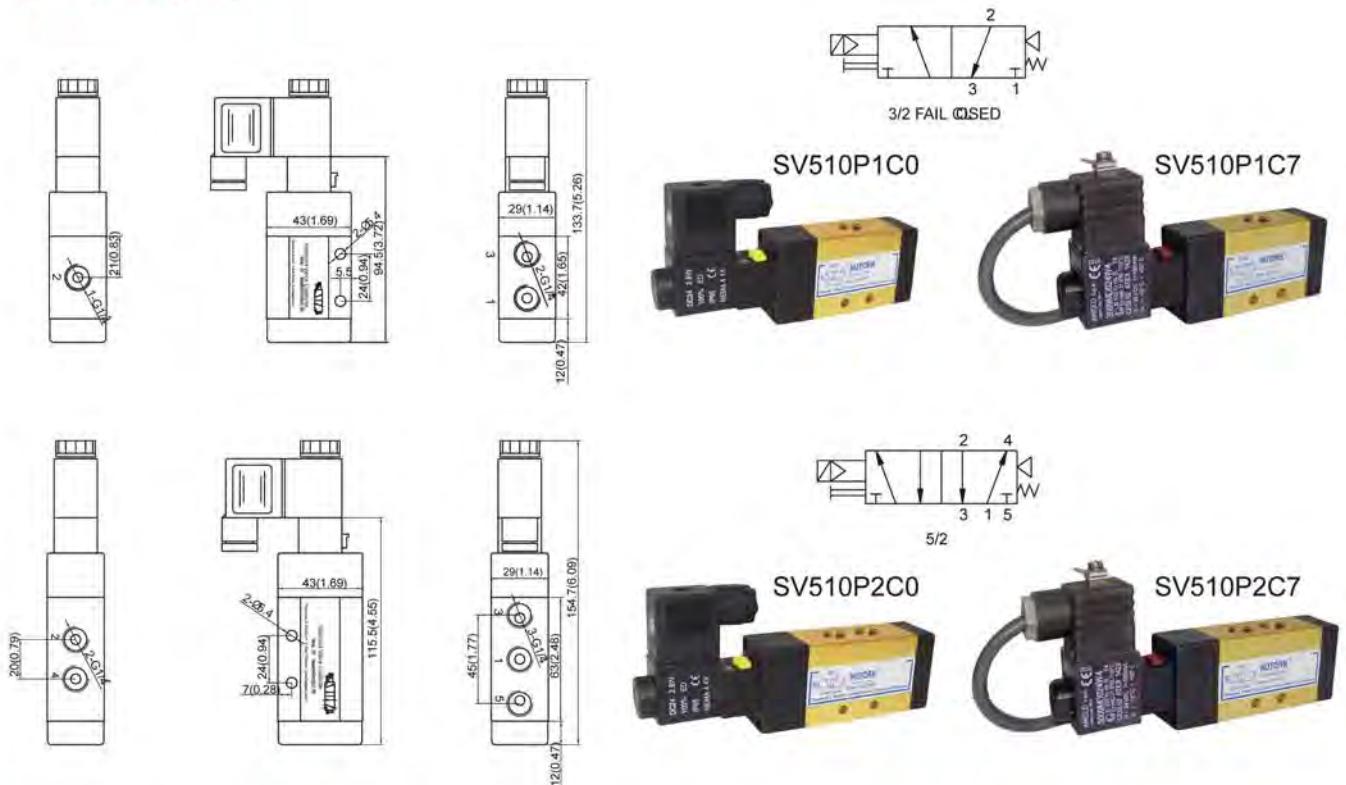


SV510P1/P2C0/C7 Mono-stable Solenoid Valve

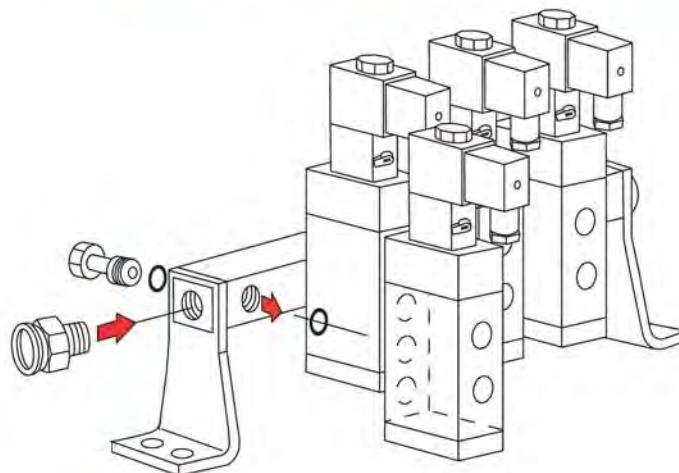
Main Features

- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ Manual override on the body.
- ※ The same spool valve can be fitted with IP65 NEMA4, 4X coil (C0) or with Ex mb II T4 or T5 coil (C7).

Dimensions



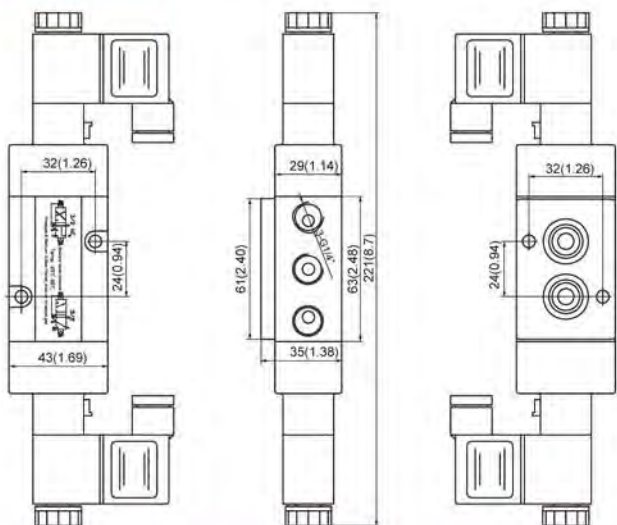
Assembly and Mounting (According to Namur VDI/VDE 3845)



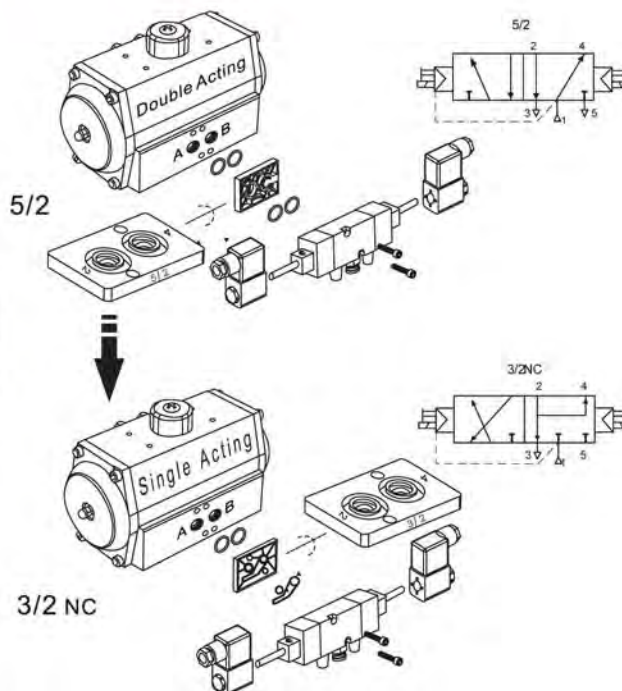
SV520F3C0/C7 Bi-stable Solenoid Valve

- ※ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators; Manual override on the pilot body.
- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ The same spool valve can be fitted with IP65 NEMA4,4X coils (C0) or with Ex mb II T 4 or T5 coils (C7).

Dimensions



Assembly and Mounting (According to Namur VDI/VDE 3845)

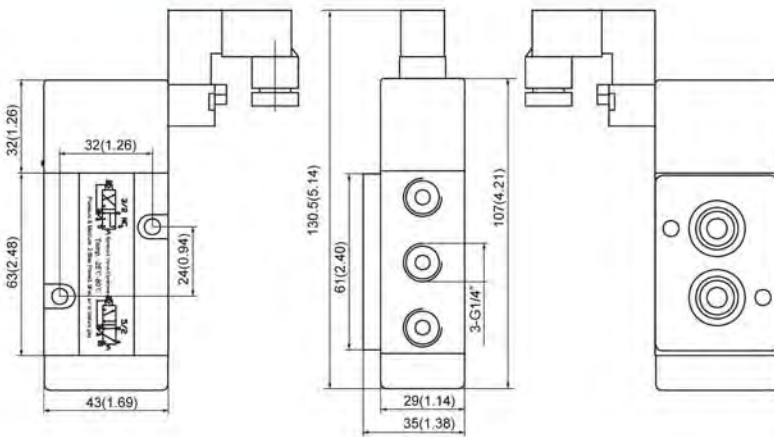


SV510F3C1/C2/C3 Mono-stable Solenoid Valve

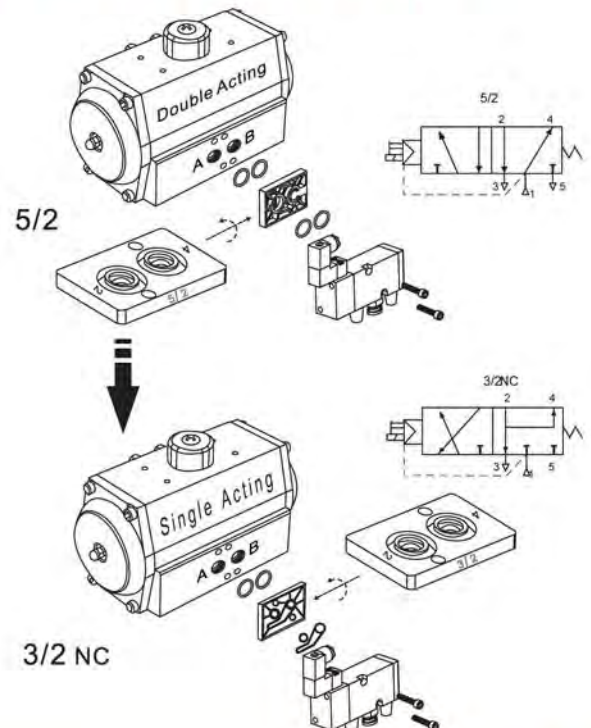
Main Features

- ✳ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators. Manual override on the pilot coil.
- ✳ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ✳ This spool valve can be fitted with 15mm miniature pilot coil (C1/C2/C3) valve according to CNOMO interface for directing wiring to ASi Master or PLC.

Dimensions



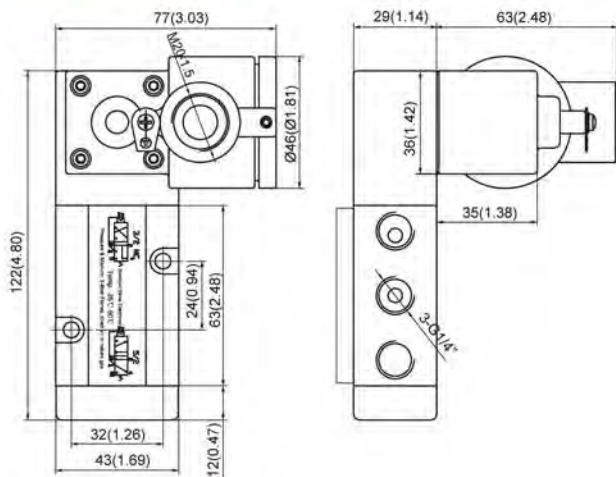
Assembly and Mounting (According to Namur VDI/VDE 3845)



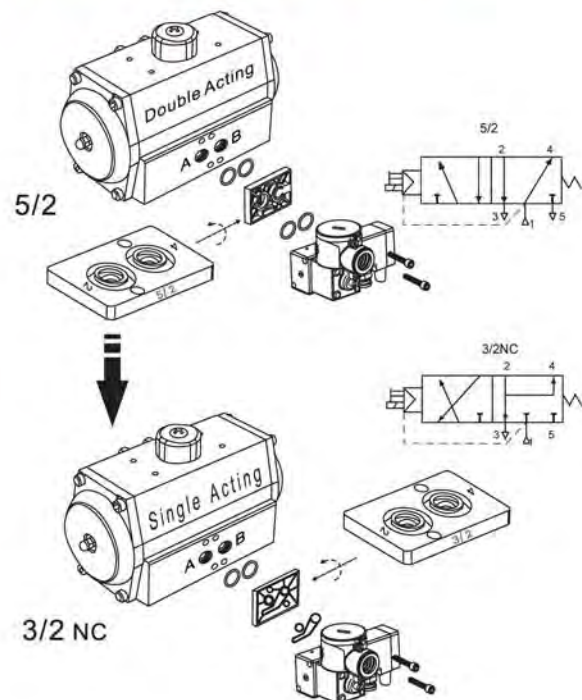
SV510F3C4/C5 Mono-stable Solenoid Valve

- ※ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators in the normal or hazardous (Ex mB II T4 or T6) area; Manual override on the pilot coil.
- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ This spool valve can be fitted with aluminium or stainless steel enclosure coil certified for use in corrosive area and in hazardous area(Class I,Div.1 Droup A,B,C,D, EExd IIC T6).

Dimensions



Assembly and Mounting (According to Namur VDI/VDE 3845)

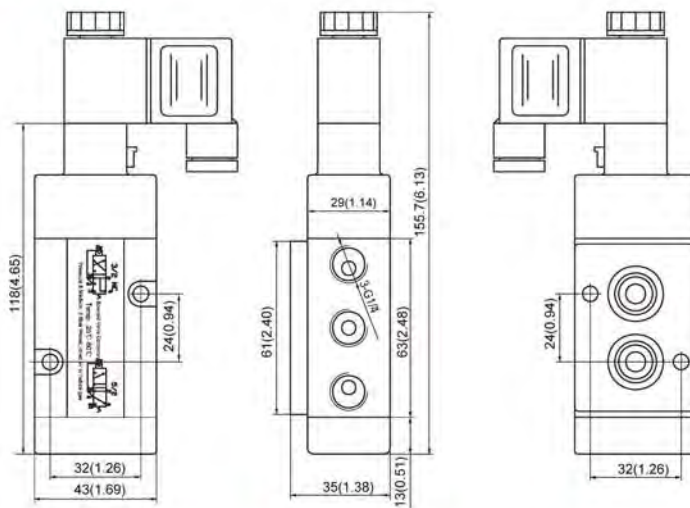


SV610F3C0/C7 Stainless Steel Mono-stable Solenoid Valve

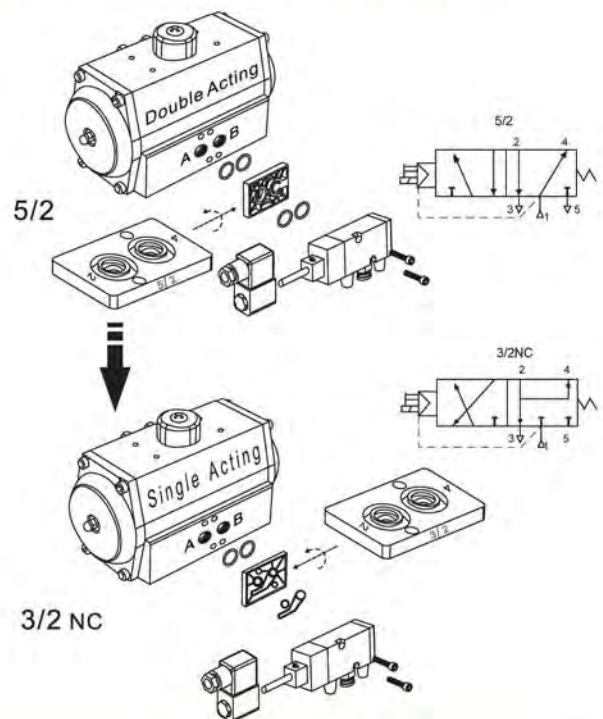
Main Features

- ※ Stainless steel(316) spool valve suitable for application in corrosive area.
- ※ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators. Manual override on the pilot body.
- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ The same spool valve can be fitted with IP65 NEMA4, 4X coil (C0) or with Ex mb II T4 or T5 coil (C7).

Dimensions



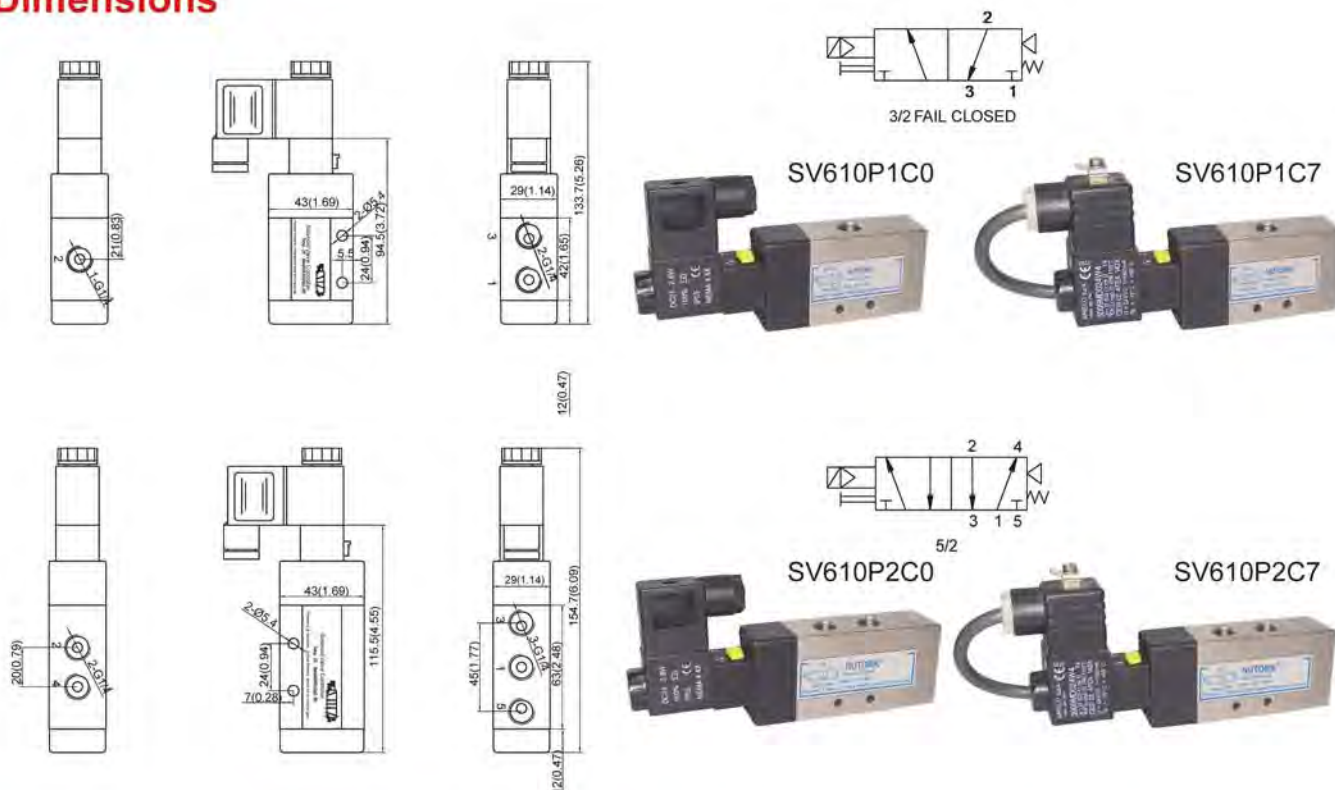
Assembly and Mounting (According to Namur VDI/VDE 3845)



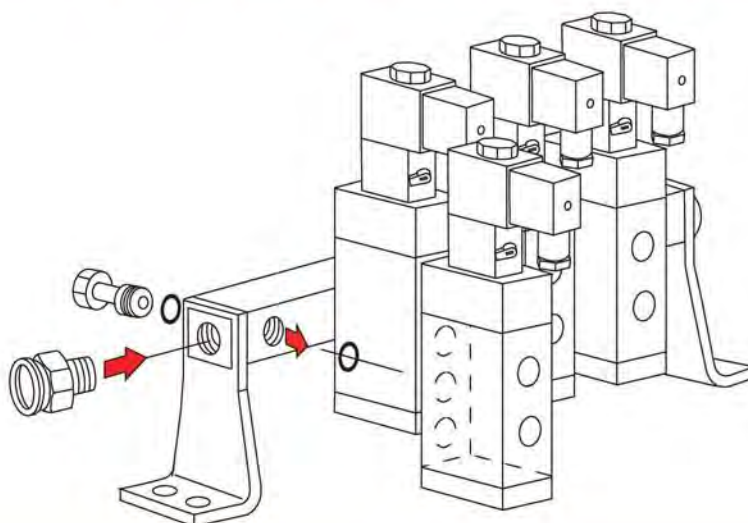
SV610P1/P2C0/C7 Stainless Steel Mono-stable Solenoid Valve

- ※ Stainless steel(316) spool valve suitable for application in corrosive area.
- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ Manual override on the body.
- ※ The same spool valve can be fitted with IP65 NEMA4, 4X coil (C0) or with Ex mb II T4 or T5 coil (C7).

Dimensions



Assembly and Mounting(Supply rail with seals and banjo bolts in stainless steel)

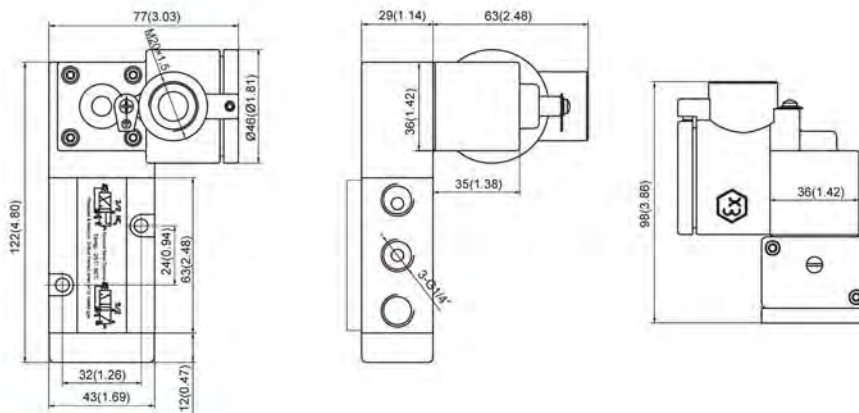


SV610F3/P1/P2C4 Stainless Steel Mono-stable Solenoid Valve

Main Features

- ※ Stainless steel(316) spool valve suitable for application in corrosive area.
- ※ The same spool valve can be adapted for 3/2 NC or 5/2 functions for controlling double-acting and single-acting pneumatic actuators. Manual override on the pilot body.
- ※ All the exhaust ports of this spool valve are connectable which offer excellent environmental protection against the ingress of liquids, dusts or other foreign matter.
- ※ This spool valve can be fitted with stainless steel enclosure coil certificated for use in corrosive area and in hazardous area(Class I,Div.1Droup A,B,C,D, EExd IIC T6).

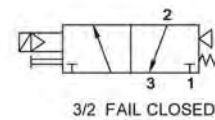
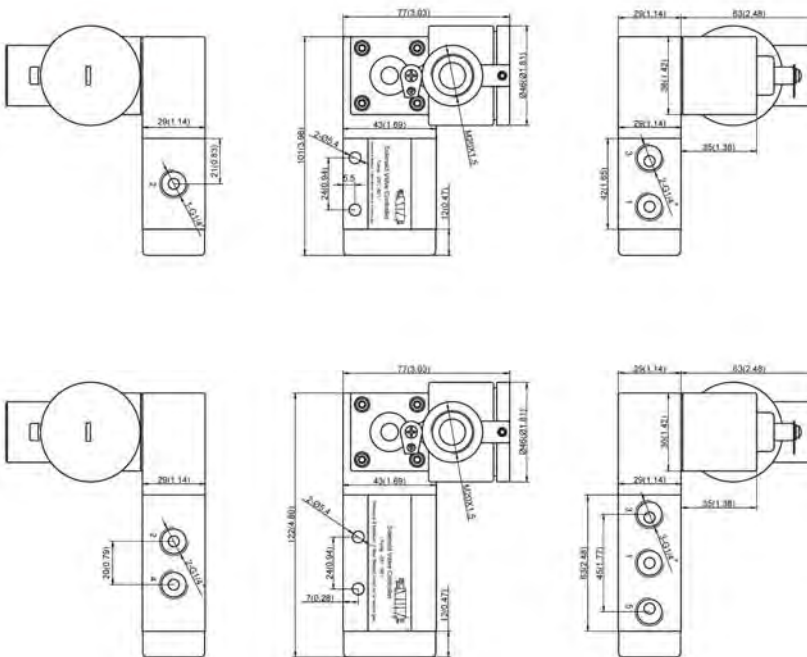
Dimensions



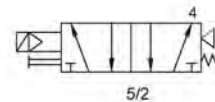
SV610F3C4



Dimensions



SV610P1C4



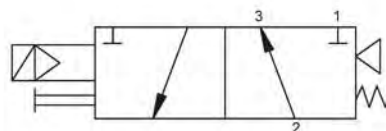
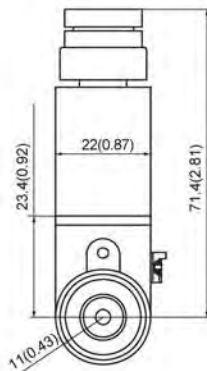
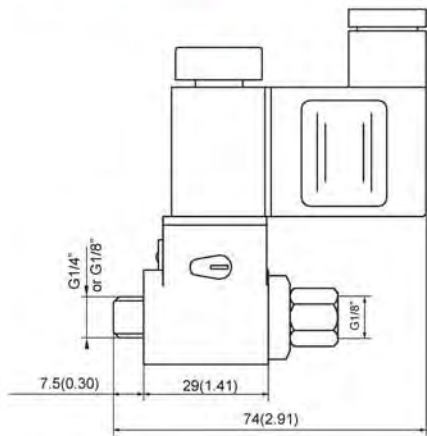
SV610P2C4



SLV010P1C0 Miniature Directing Acting Solenoid Valve

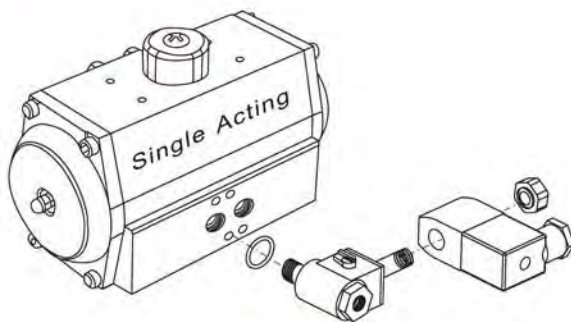
- ※ Direct acting 3/2 Normal Closed.
- ※ Direct mounting on 1/4" or 1/8" air port of actuator. Manual override on the body.

Dimensions



3/2 FAL CLOSED

Assembly and Mounting

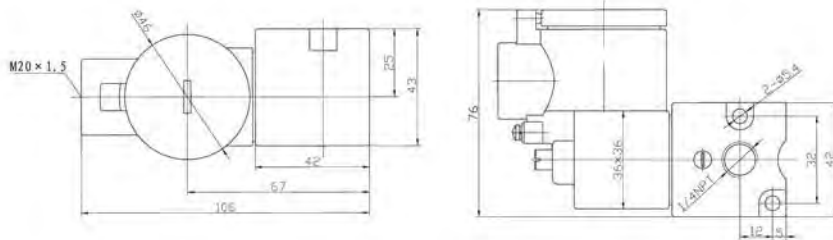


SV110(210)F1C4/C5 Directing Acting Solenoid Valve

Main Features

- ※ The valve and the enclosure of coil are available in stainless steel(316) or aluminum. Direct acting 3/2 Normally
- ※ Multi-mount, Namur and threaded connections on same body(1/4 or 1/8").
- ※ Manual override as standard.
- ※ This valve can be fitted with aluminium or stainless steel enclosure coil certificated for use in corrosive area and in hazardous area (Class I,Div.1 Droup A,B,C,D, EExd IIC T6).

Dimensions



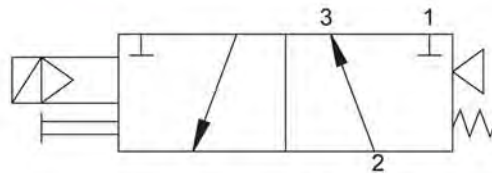
SV210F1C4



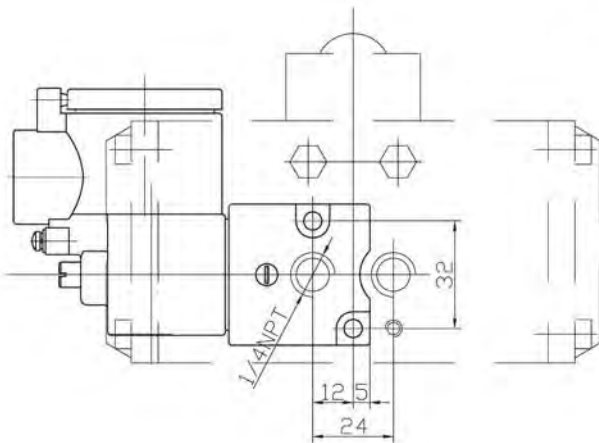
SV110F1C5



Assembly and Mounting



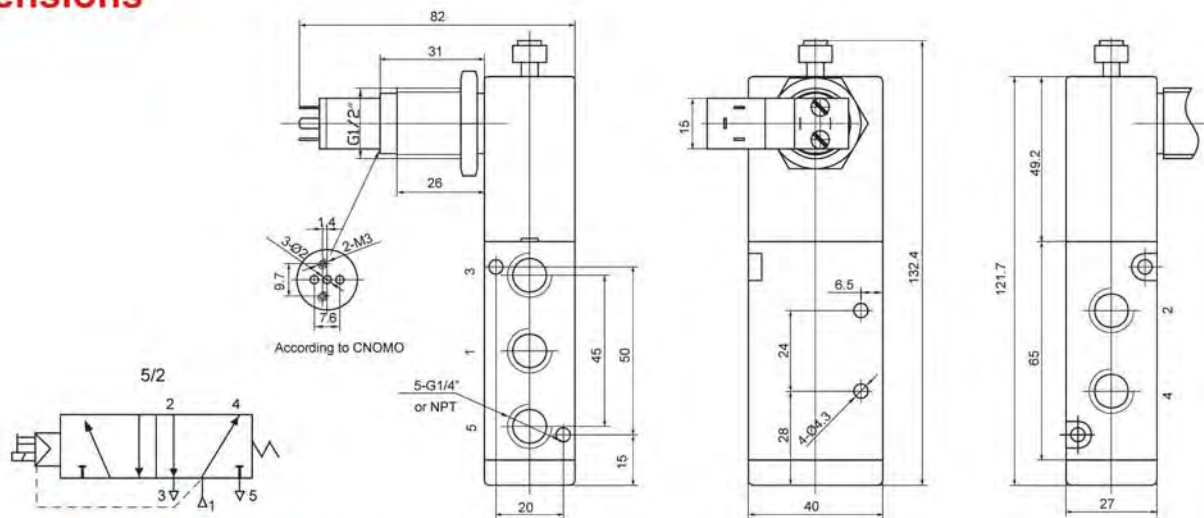
3/2 FAIL CLOSED



SV310P2C1/C2/C3 Internal Solenoid Valve

- ✱ The coil of the Internal Solenoid Valve can be mounted inside the enclosure of our Limit Switch Box range (Series 300/400/500 or 600) see photograph below, thus giving the coil protection to IP67 or Eex d.
- ✱ This valve can be assembled with the 15mm miniature pilot coil (C1/C2/C3), the valve design is to CNOMO interface standard for directing wiring to ASi Master or PLC.
- ✱ Fitted as standard with Outside manual override.

Dimensions



Assembly and Mounting



SV310P2C1



SV310P2C2



SV310P2C3

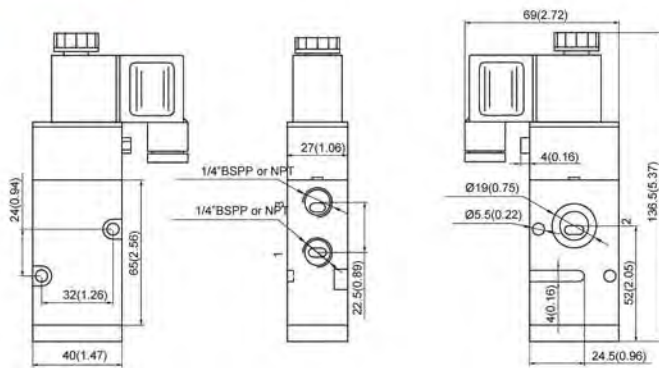


SV310F1/F2C0 Mono-stable Solenoid Valve

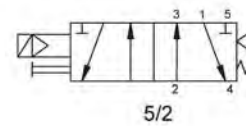
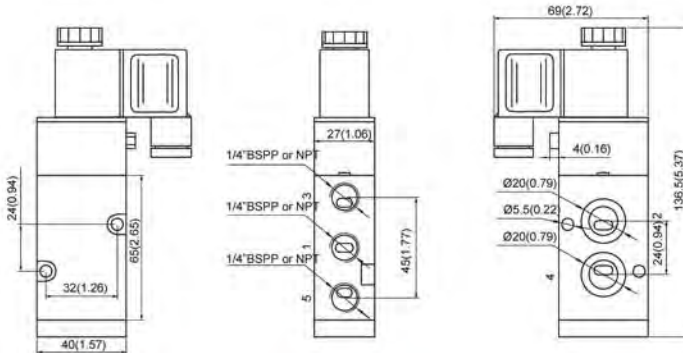
Main Features

- ✳ Based on Namur standard(24×32), the spool valve can be directly mounted on pneumatic actuator for controlling double-acting or single-acting pneumatic actuators.
- ✳ Manual override on the body.
- ✳ Excellent in doors.

Dimensions



SV310F1C0



SV310F2C0



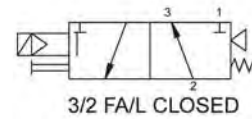
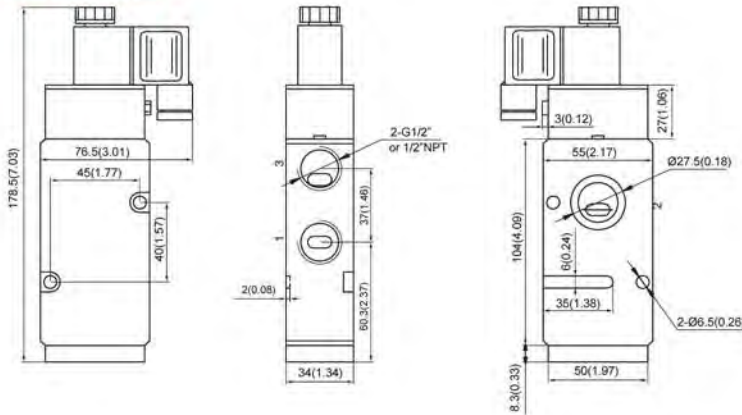
Assembly and Mounting (According to Namur VDI/VDE 3845)



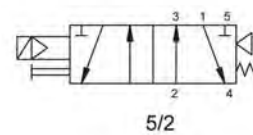
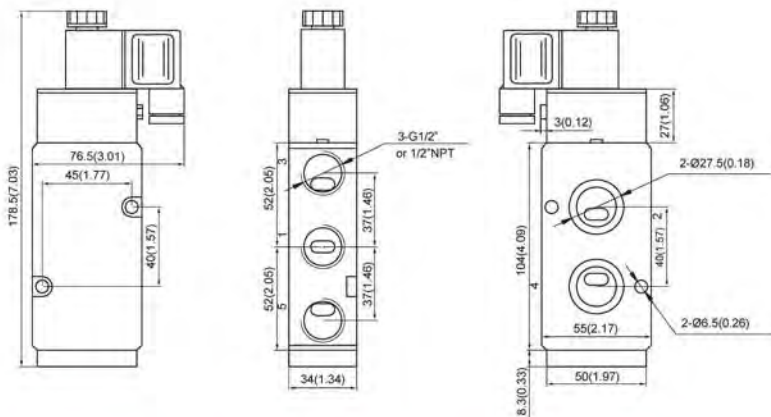
SV410F1/F2C0 Mono-stable Solenoid Valve

- ※ Based on Namur standard(40×45), the spool valve can be directly mounted on pneumatic actuator for controlling double-acting or single-acting pneumatic actuators.
- ※ Manual override on the body.
- ※ Excellent in doors.

Dimensions



SV410F1C0



SV410F2C0



Assembly and Mounting (According to Namur VDI/VDE 3845)

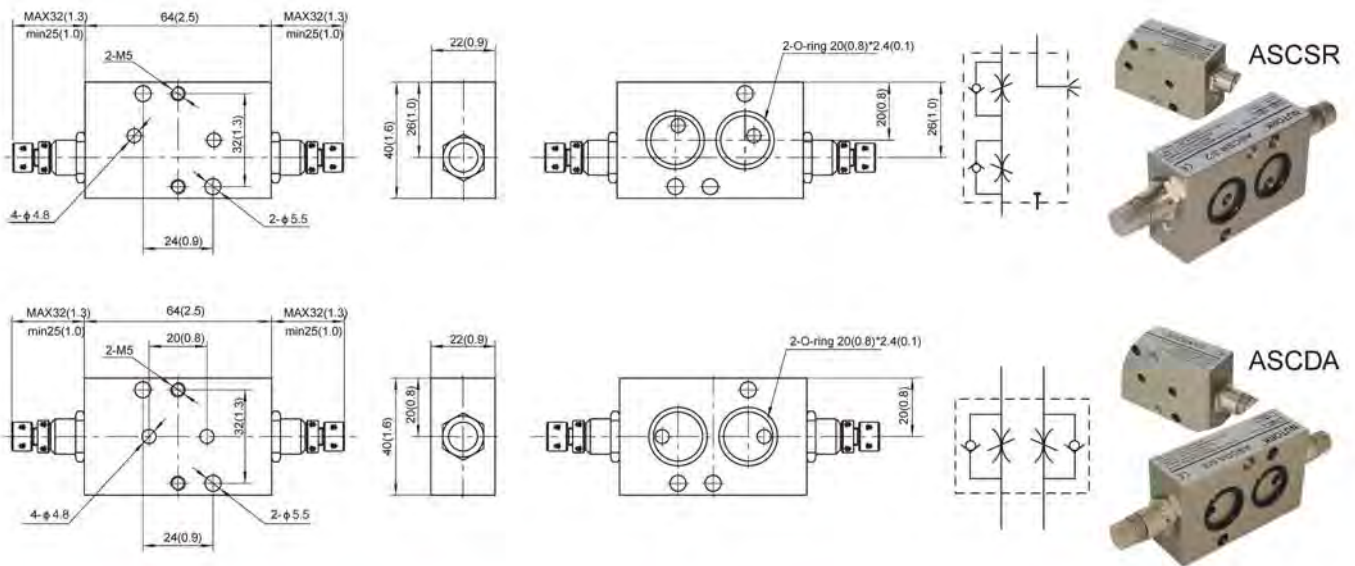


ASCSA/SR Actuator Speed Controller

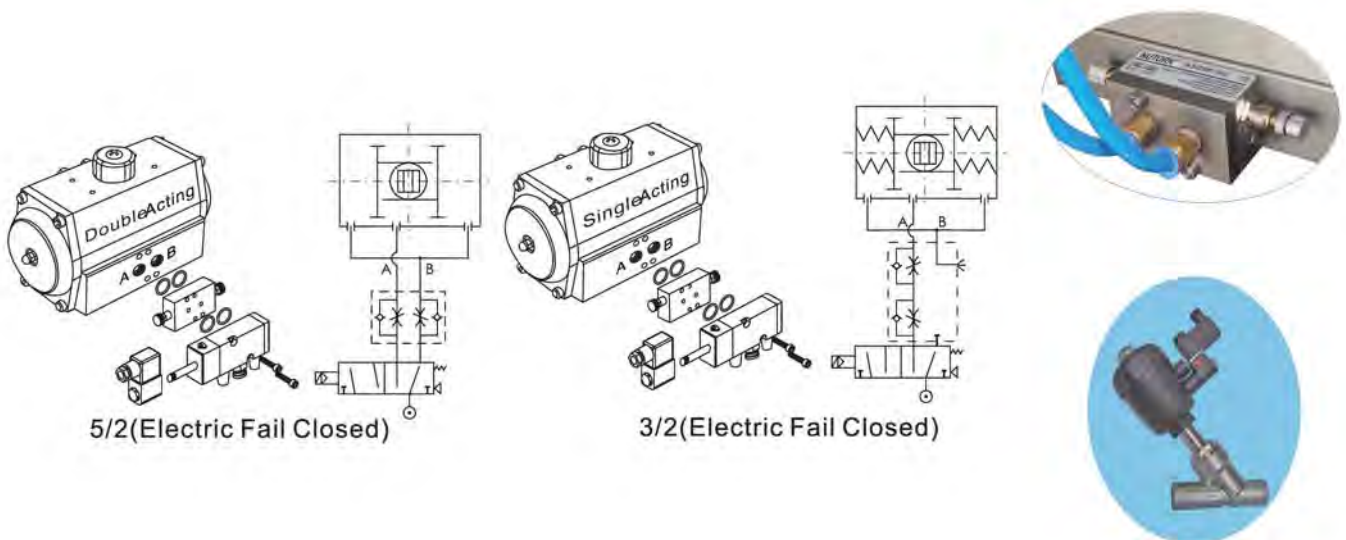
Main Features

- ※ Mounted directly to pneumatic actuators or used with Namur solenoid valves and/or positioner for the use of controlling the opening and closing speeds of pneumatic actuators.
- ※ The speed controller is able to control the rotary speed of the actuator at any rate accurately, consistently & safely

Dimensions

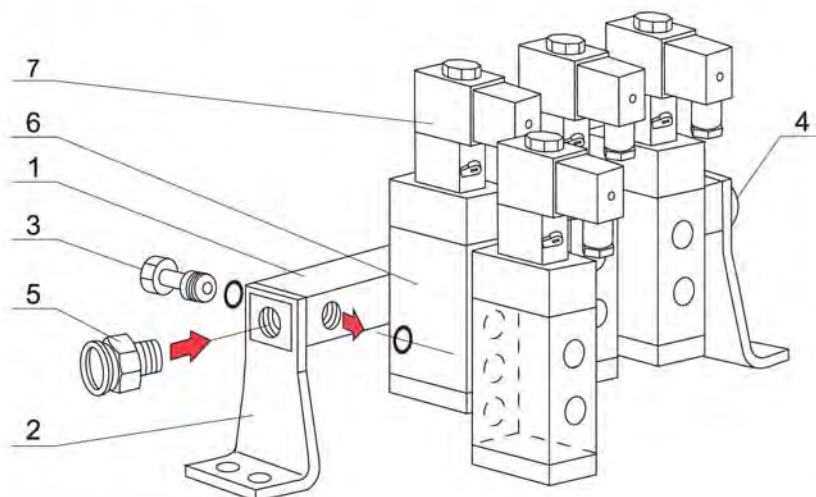


Assembly and Mounting (According to Namur VDI/VDE 3845)



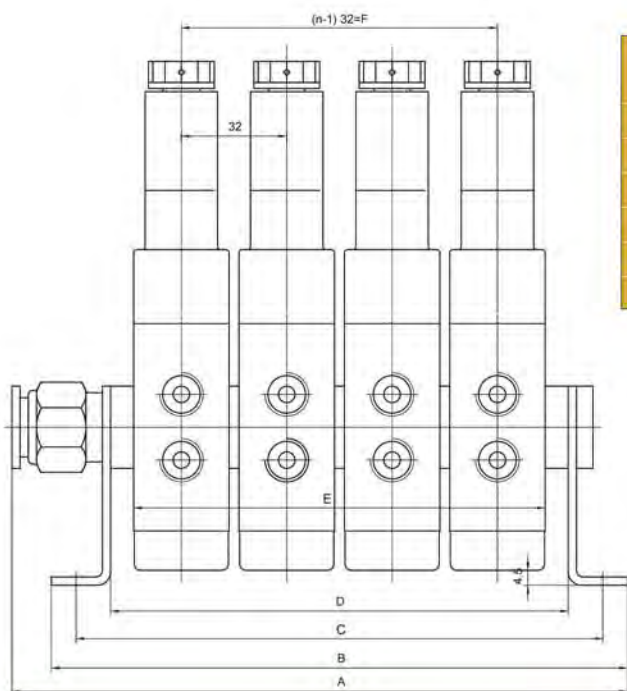
SV manifold solenoid valve bracket (ALV-MB) is structured by supply rail with brackets, seals and banjo bolts. This solution is simple, easy assembly and save space.

Structure, Parts and the materials

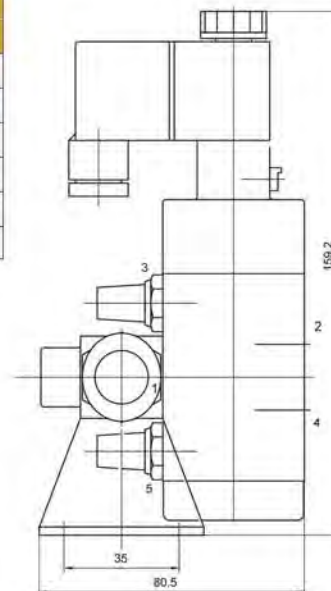


No.	Name	Model No.	Material
1	Supply rail	SV-MB01	Stainless steel 304 or 316
2	Bracket	SV-MB02	Stainless steel 304 or 316
3	Banjo Bolts	SV-MB03	Stainless steel 304 or 316
4	Plug Bolts	SV-MB04	Stainless steel 304 or 316
5	Air Connector	SV-MB05	Brass or stainless steel
6	Spool Valve	SVP510P2, ALVP610P2	Aluminm or Stainless steel 304 or 316
7	Coil	C0,C1,C7	

Dimension of the supply rail valve base



	Numberer of valves		
	2	4	10
A	123	187	379
B	111	175	367
C	96	160	352
D	75	139	331
E	61	125	317
F	32	96	288










Accessory

Name of Product	Specification	Photo	Application		
Brass Silencer	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Brass Plain Silencer	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Stainless steel Plain Silencer	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Plastic Silencer	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Brass Speed Control	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Brass Speed Control	G or NPT1/8"				
	G or NPT1/4"				
	G or NPT3/8"				
	G or NPT1/2"				
Brass Pipe Connector	G or NPT1/8"-6/8mm				
	G or NPT1/4"-6/8mm				
	G or NPT3/8"-6/8mm				
	G or NPT1/2"-6/8mm				
Nickel coated Pipe Connector	G or NPT1/8"-6/8mm				
	G or NPT1/4"-6/8mm				
	G or NPT3/8"-6/8mm				
	G or NPT1/2"-6/8mm				
Cable Gland	Brass nickel coated				
	M20-1.5, 6~12mm				
	Brass nickel coated				
	1/2", 6~12mm				
	Brass nickel coated				

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

Nutork Corp. supply the following product range:

	<p>NK series rack & pinion type (CE-ATEX certified and PED compliant) 14 models, the output torque from 9Nm(80in.lbs) to 3,920Nm(34,660in.lbs) at 6 bar air supply. ISO5211/DIN3337 for valve connection, VDI/VDE 3845(Namur) standard connection for solenoid valve and shaft top end(limit switchbox or E/P positioner), +/-5 degree stroke adjustment. 25~30um standard hard anodized treatment on actuator body and over 120um epoxy coated on end caps which meet ASTM B117 qualification(salt spread test over 1,000 hours and no corrosion).</p> <p>PTFE, Polyester, Nickel, Ceramic and Epoxy coated are available on request.</p>
	<p>NSF series scotch yoke type pneumatic and hydraulic actuators (CE-ATEX certified and PED compliant) The output torque from 978Nm(8,656in.lbs) to 226,200Nm (2,001,870in.lbs) at 6 bar air supply. Anti-corrosion painting on outer body and cylinder as standard. VDI/VDE 3845(Namur) standard connection for shaft top end(limit switchbox or E/P positioner), +/-10 degree stroke adjustment. ISO5211 standard for valve connection. PTFE coated on inner cylinder surface. Hydraulic manual override is available for big size actuator.</p>
	<p>NTE series electric actuator, CE approval 13 models and the output torque from 18Nm(159in.lbs) to 6000Nm(53,106in.lbs), compact design, die-casting aluminum alloy housing, alloy steel with heat treatment gear driving unit, integral wormgear & drive shaft, 30% duty rating, detachable crank handle, ISO5211(option), IP67 enclosure.IP68 for option.</p>
	<p>NTQ electric actuator, CE approval(IP67 & EExdIIBT4 enclosure) 13 models, the output torque from 100Nm(885in.lbs) to 6,000Nm(53,106in.lbs), de-clutchable manual override, 2xSPDT each for open & close, torque switch: 1xSPDT each for open & close. space heater, self-lock, IP67 & EExdIIBT4 enclosure.</p>
	<p>The fully range accessories(Limit Switchbox, Solenoid Valve, Dec clutchable Manual Override, Air Filter regulator, E/P Positioner ---etc).</p>
	<p>Ball Valve 1/4"~ 4": 1000WOG/2000WOG screwed/butt weld/socket weld/tube end full port ball valve 1/2"~8": PN10~PN40/150lb~300lb/JIS10K~20K; 2 way & muti-way ball valves and ceramic lined flanged end full & reduced port ball valves are available</p>
	<p>Soft Seated Butterfly Valve Wafer/Lug type: 2" ~ 56": PN10~PN16/125lb~150lb/10K~16K; The other sizes are available upon request 3-2)Double flanged: 2"~48": PN10~PN16/125lb~150lb; The other sizes are available upon request 3-3) PTFE lined: Wafer/Lug type, 2"~24": PN10~PN16/125lb~150lb/10K~16K ; The other sizes are available upon request</p>

NUTORK Corp.

USA Office:
 5010 Wright RD. Suite 200B Stafford,
 TX 77478
 Tel: +1-281-222-0018
 Email: nutork-usa@nutork.com
 Website: www.nutork.com

China Office:
 No.10,Lane 899, Zhuguang Road,
 Qingpu Area, Shanghai,China
 Tel: 021-59887103/59888463/59888436
 Fax: 021-59887203
 Email: nutork@nutork.com