

# STC 2S160-500 Series Stainless Steel Solenoid Valves

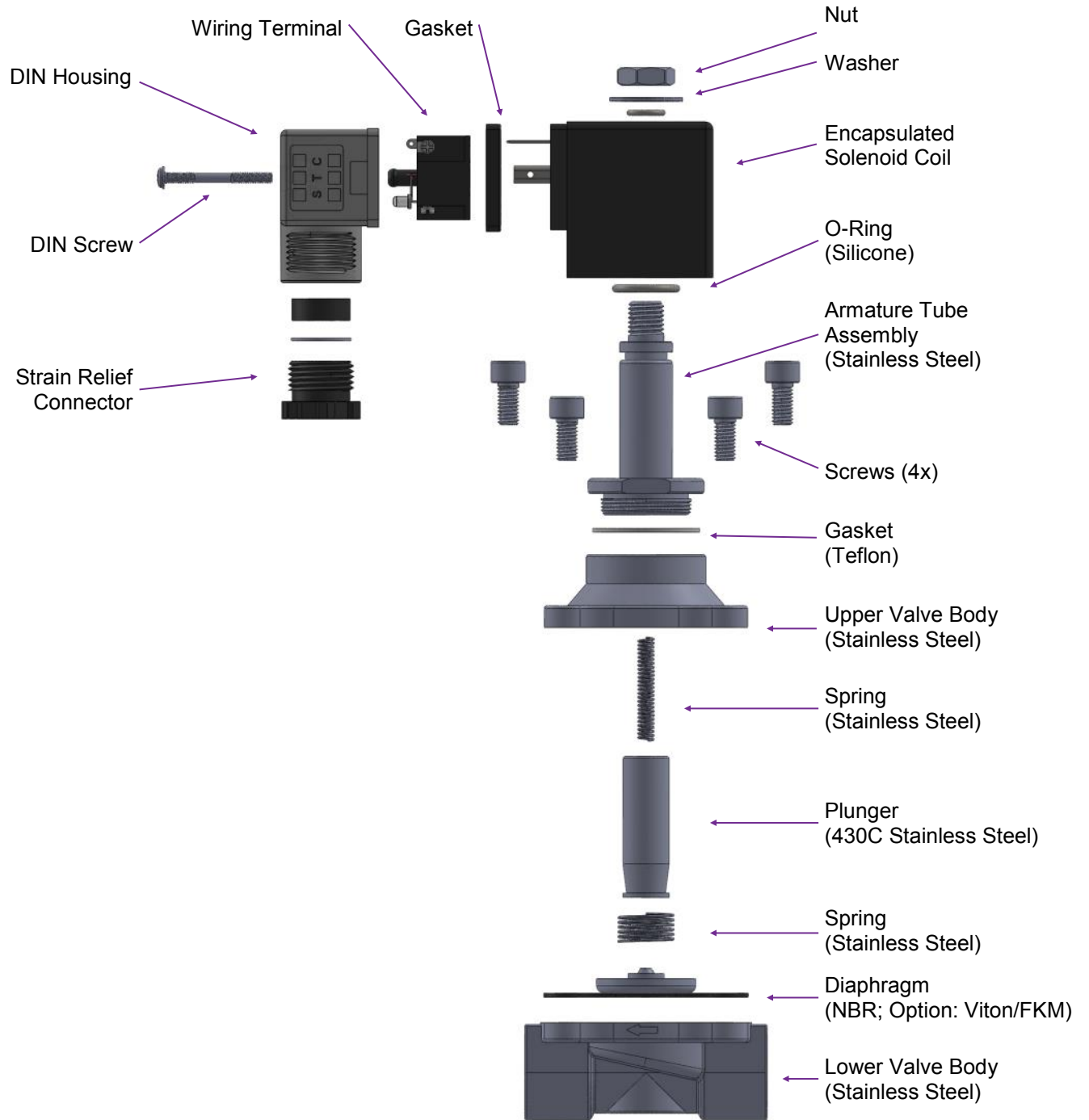
## Two-Way, Direct Lift Diaphragm, Normally Closed



### 2S160-500 Stainless Steel Series Specifications

Valve Model	2S160-3/8	2S160-1/2	2S200-3/4	2S250-1	2S350-1 1/4	2S400-1 1/2	2S500-2
Valve Type	2 Way, Normally Closed (NC)						
Action	Direct Lift Diaphragm, Uni-Directional, Zero Differential						
Orifice Cv)	16 (4.8)	16 (4.8)	20 (7.6)	25 (12)	35 (24)	40 (29)	50 (48)
Operating Pressure	DC Coil: Vacuum to 100 PSI   AC Coil: Vacuum to 150 PSI						
Proof Pressure	300 PSI						
Operating Temperature	Media: -5 to 80°C (NBR Seal), -5 to 120°C (Viton Seal); Ambient: -5 to 45°C						
Port Size (NPT)	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
Wetted Surfaces	Valve Body: Stainless Steel Seals: NBR (Buna); Option: Viton (FKM) Armature Assembly: Stainless Steel						
Coil Duty	Class H, IP65, 100% ED (Continuous Duty)						
Voltage	Options: 12, 24VDC; 24VAC, 110/120VAC (50/60Hz), 220/240VAC (50/60Hz)						
Voltage Tolerance	±10% of Specified Voltage						
Coil Power	DC: 20W   AC: 28VA (@ 50Hz) 2W200C Coil				DC: 30W   AC: 28VA (@ 50Hz) 2WO250C Coil		
Electrical Connections	DIN 43650, Form A						
Installation	No Orientation Requirement (Optimum Position: Flow Horizontal and Solenoid Vertical)						
Service	Air, Inert Gas, Liquid, Vacuum						

# 2S160-500 Stainless Steel Series Components



# Material Test Reports

This document certifies that STC products have been subjected to quality assurance procedures and meet the material and performance specifications published by Sizto Tech Corporation (STC). The products have been manufactured, processed, inspected, and tested according to STC internal requirements and ISO 9001 standards.

ISO 9001:2008 Certificate Number: **Q17150329**  
 Date of Issue: **10, March, 2015**  
 Valid Until: **09, March, 2018**

Individual materials and components used in this product have been tested and conform to applicable published standards according to chart below. Please be advised that STC does not conduct its own material analysis of all raw materials, rather, STC relies on the statements of its material suppliers & reserves the rights to independently test raw materials if necessary. Material Test Reports may be available for specific products upon request.

Material	Use Location	Material Standard
316 Stainless Steel	Metal Fittings, Valves, Air Cylinders	ASTM A240/A2666
304 Stainless Steel	Valves, Air Cylinders	ASTM A240/A666
CF8M Stainless Steel	Valves	ASTM A351/A743
Brass	Valves	ASTM B36/B62
Nickel-Plated Brass	Composite Fittings	ASTM B456/B927
Acetal Homopolymer (Delrin)	Valves	ASTM D4181/D6778—14
Acetal Copolymer (POM)	Composite Fittings	ASTM D4181/D6778—14
FKM (Viton)	Seals	ASTM D1418
PTFE (Teflon)	Valves, Seals	ASTM D3294—15
NBR (Buna N)	Seals	ASTM D1387—06
EPDM	Seals	ASTM D3568—03
Polybutylene Terephthalate (PBT)	Composite Fittings	ASTM D4000



# Installation & Operation

## To Connect the Valve Inlet & Outlet:

- Connect the inlet & outlet to the valve ports according to the flow direction arrow marked on the valve

## To Install the Coil:

- Put the coils on to the armature tube of the valve. Place the lock washer & nut on to the armature tube. Hand tighten the nut, then use a wrench to tighten the nut another quarter-turn. Do not over-tighten the nut, as it may cause the armature tube to fail prematurely.

## To Connect a DIN Coil:

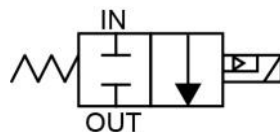
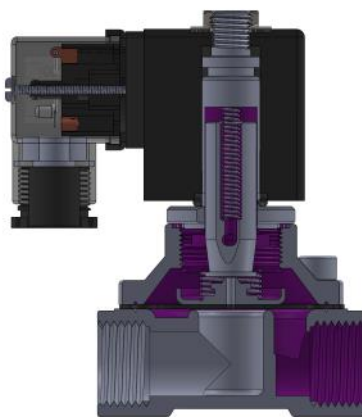
1. Remove the Philips-head screw from the plastic DIN housing & unplug it from the DIN coil
2. From the screw opening, push the terminal block out from the plastic DIN housing.
3. Note the “1”, “2”, and ground “ $\perp$ ” symbols on the underside of the DIN enclosure.
4. For DC DIN Coils, connect “1” to your Positive Lead & “2” to your Negative lead.
5. For AC DIN Coils, connect “1” to your HOT lead, “2” to your Neutral lead, & “ $\perp$ ” to your ground if required.

**Do not energize the coil without installing it onto the valve or connect the coil to a different voltage than specified. This will burn the coil and could create fire hazards.**

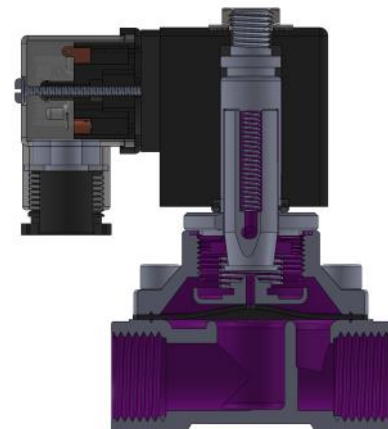
**Safety Note:** Standard valves are supplied with continuous duty coils. The proper class of insulation for the service is indicated on the coil body. The coil temperature may rise significantly if energized for extended periods—this is normal. Although the coil is made of flame-retardant material, misuse of the coil could create fire hazards & generate smoke and/or a burning odor. If these conditions are encountered, the coil temperature has risen above safe levels and the power should be disconnected immediately.

**Operation:** This valve is a two-way, normally closed, direct-lift valve & does not require a minimum differential pressure to operate. As shown in the diagrams below, when the coil is de-energized (left diagram) the plunger & flexible diaphragm sit on the main valve orifice. The working medium flows through a tiny “bleed orifice” and pressurizes the cavity above the diaphragm — this system pressure, along with the spring force, seals the valve. When the valve is energized the diaphragm is pulled away from the main orifice, allowing fluid to flow through the valve. Since the bleed orifice is dimensionally smaller than the main orifice, the system pressure cannot rebuild on the top of the diaphragm as long as the main orifice remains open. The working medium & flow direction are indicated in purple in the diagrams.

### De-Energized (Closed)



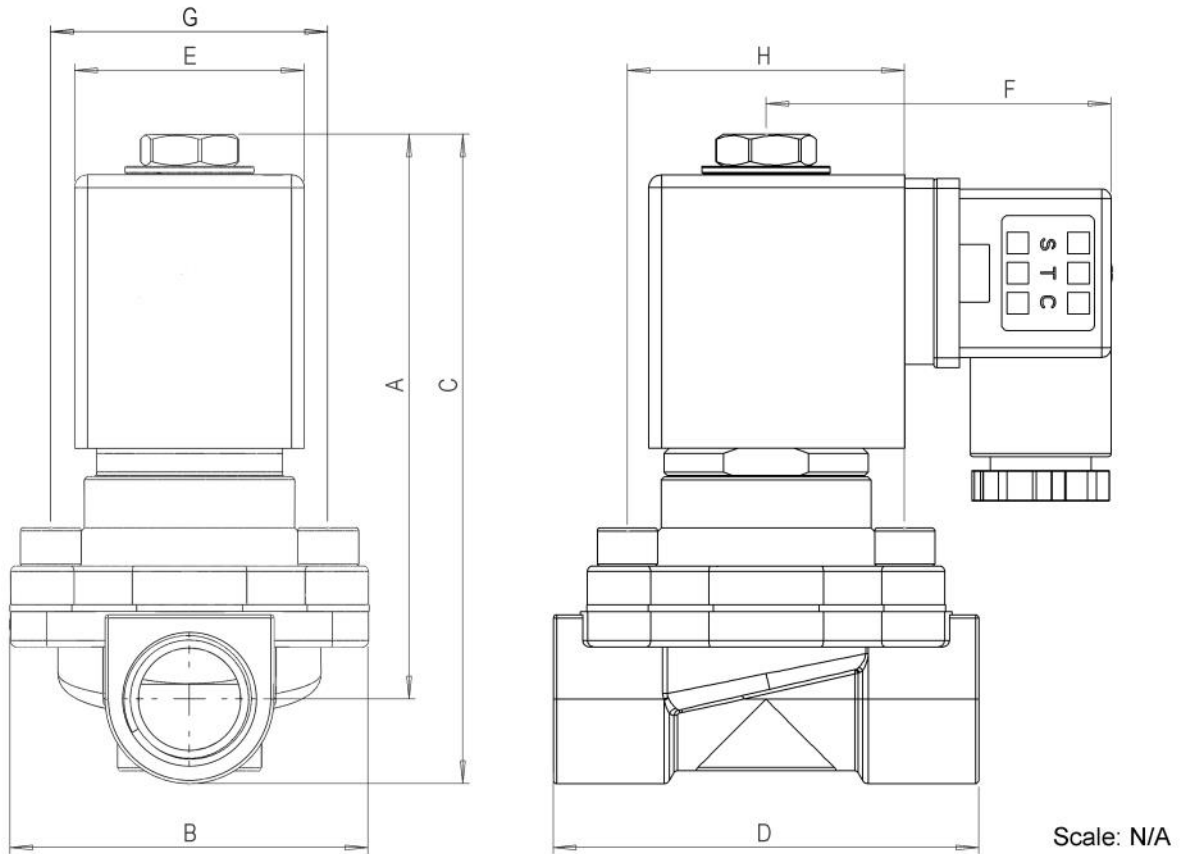
### Energized (Open)



Flow Direction



# 2S160-500 Series Solenoid Valve Dimensions



2S160-500 Dimensions [mm]										
Valve Model	Port Size (NPT)	A	B	C	D	E	F	G	H	Wt. (lbs)
2S160	3/8"	90	56	103	69	36	55	43	43	1.8
2S160	1/2"	90	56	103	69	36	55	43	43	1.8
2S200	3/4"	95	56	111	72	36	55	43	43	1.8
2S250	1"	98	76	118	98	36	55	60	60	3.2
2S350	1 1/4"	104	84	131	116	46	61	62	62	5.0
2S400	1 1/2"	111	90	139	123	46	61	66	66	5.2
2S500	2"	151	118	186	167	46	61	84	84	9.0

**Note:** Dimensions are for reference only. Field verify dimensions prior to installation for critical dimensions.



# 2-Way Direct-Lift Diaphragm Valves

## Maintenance & Troubleshooting Guide

**Warning:** DO NOT over tighten the nut holding the coil to the armature tube. Over tightening may result in damage to the welded joint.

### Attaching a Coil to a Valve:

- After wiring the coil, fit the coil assembly over the armature tube. Ensure that the threads of the tube are accessible.
- Fit the spring or lock washer over the assembly.
  - For spring washers, the concave side should be oriented toward the coil.
- Tighten the nut over the washer by hand.
  - For standard washers, tighten the nut an additional  $\frac{1}{4}$  turn with a wrench if necessary.
  - For spring washers, continue to tighten the nut until the spring washer is almost completely compressed.

### Installation Procedure:

- Connect the default outlet to the outlet port indicated by an arrow or the number “1” on the valve body.
- Connect the default inlet to the pressure port indicated by the tail of the arrow or a “P” on the valve body.
- The arrow marked on the valve body indicates the direction of flow.

### Notes:

- After an extended period of operation, the solenoid coil may burn out. This commonly occurs when input voltages are higher than the coil’s specifications. If the valve does not make a clicking sound when energized/de-energized, the coil likely needs to be replaced.
- If you are using the valve at a low temperature, it may exhibit a small leak when first activated. To fix this, cycle the valve at the highest available operating pressure until there is no longer a leak. This process will create a proper mating surface between the seal and the orifice.

### Maintenance Procedure:

1. Turn off the power supply to the valve & ensure it is safely locked-out.
2. Remove any coils attached to the valve.
3. Unscrew the upper valve body to remove the armature assembly & valve body.
4. Check for any debris that may have collected on the plunger and/or diaphragm. A buildup of particulates on the diaphragm (especially near the two orifices) can cause the valve to function poorly. Clean the diaphragm with water & make sure to use a clean working medium with the valve.
5. Place the diaphragm back onto the lower body, followed by the upper body & armature assembly.
6. Screw the upper valve body back onto the lower valve body, ensuring that the diaphragm is aligned correctly.
7. Please refer to the diagram on Page 2 of this document for a breakdown of individual components.

For tips, maintenance guides, & procedural videos, visit us at [www.youtube.com/users/STCValves](http://www.youtube.com/users/STCValves)

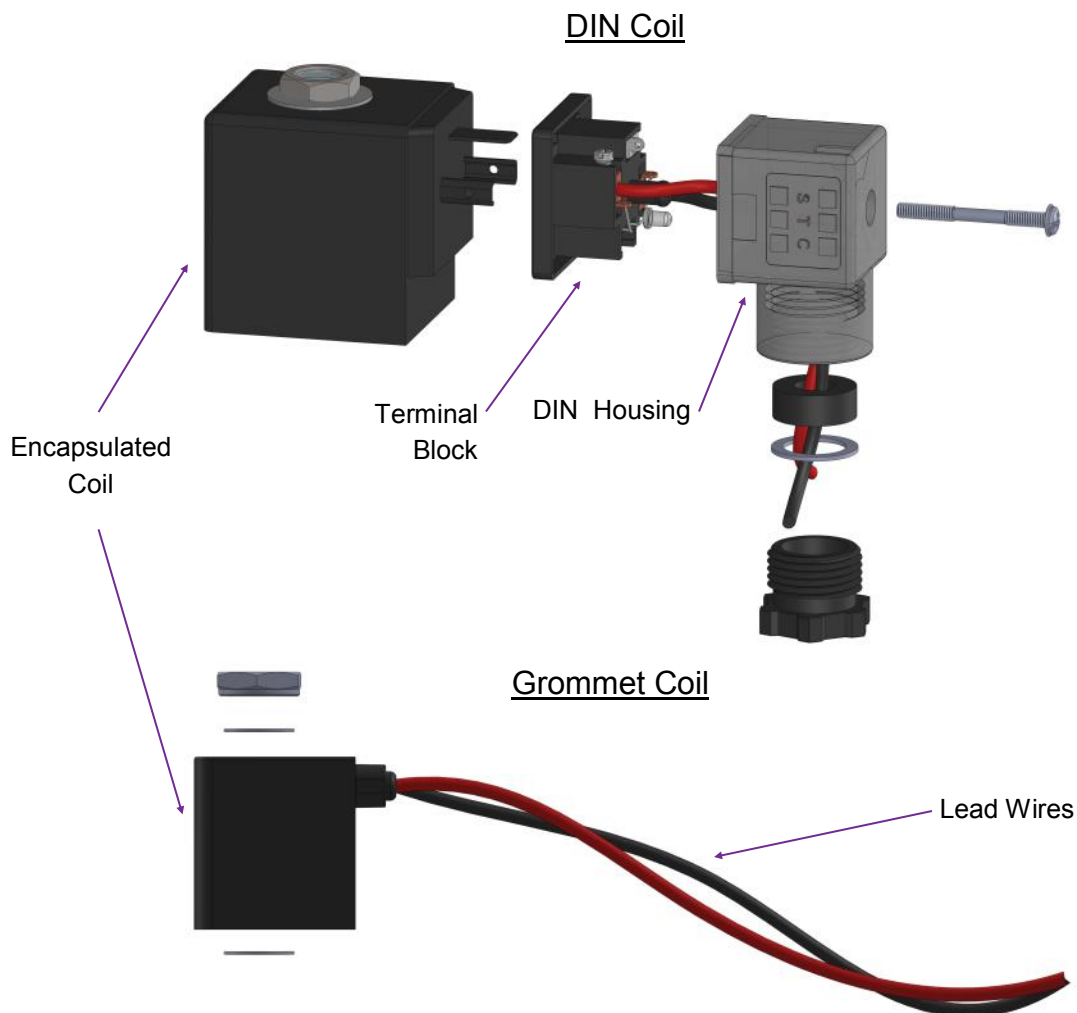
# Electrical Connections

## To Connect a DIN Coil:

- Remove the Philips screw from the plastic housing & unplug from the DIN coil.
- Use the removed screw to push the terminal block out of the plastic DIN housing.
- Note the “1”, “2”, and ground “ $\perp$ ” symbols.
  - For DC DIN Coils, connect “1” to your positive lead & “2” to your negative lead.
  - For AC DIN Coils, connect “1” to your HOT lead, “2” to your NEUTRAL lead, and “ $\perp$ ” to your ground lead, if required.

## To Connect a Grommet Coil:

- For DC Coils, connect the red wire to your positive lead & the black wire to your negative lead.
- For AC Coils, connect the black wire to your HOT lead & the white wire to your NEUTRAL lead.
- For Coils provided with Molded Cables, the color of the wire indicates the type of lead:
  - GREEN = Ground Wire
  - BLUE = Positive or HOT Wire
  - BROWN = Negative or Neutral Wire



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**International Customers:** Advance Payment Required via Bank Wire, Cashier's Check or Approved Credit Card.

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