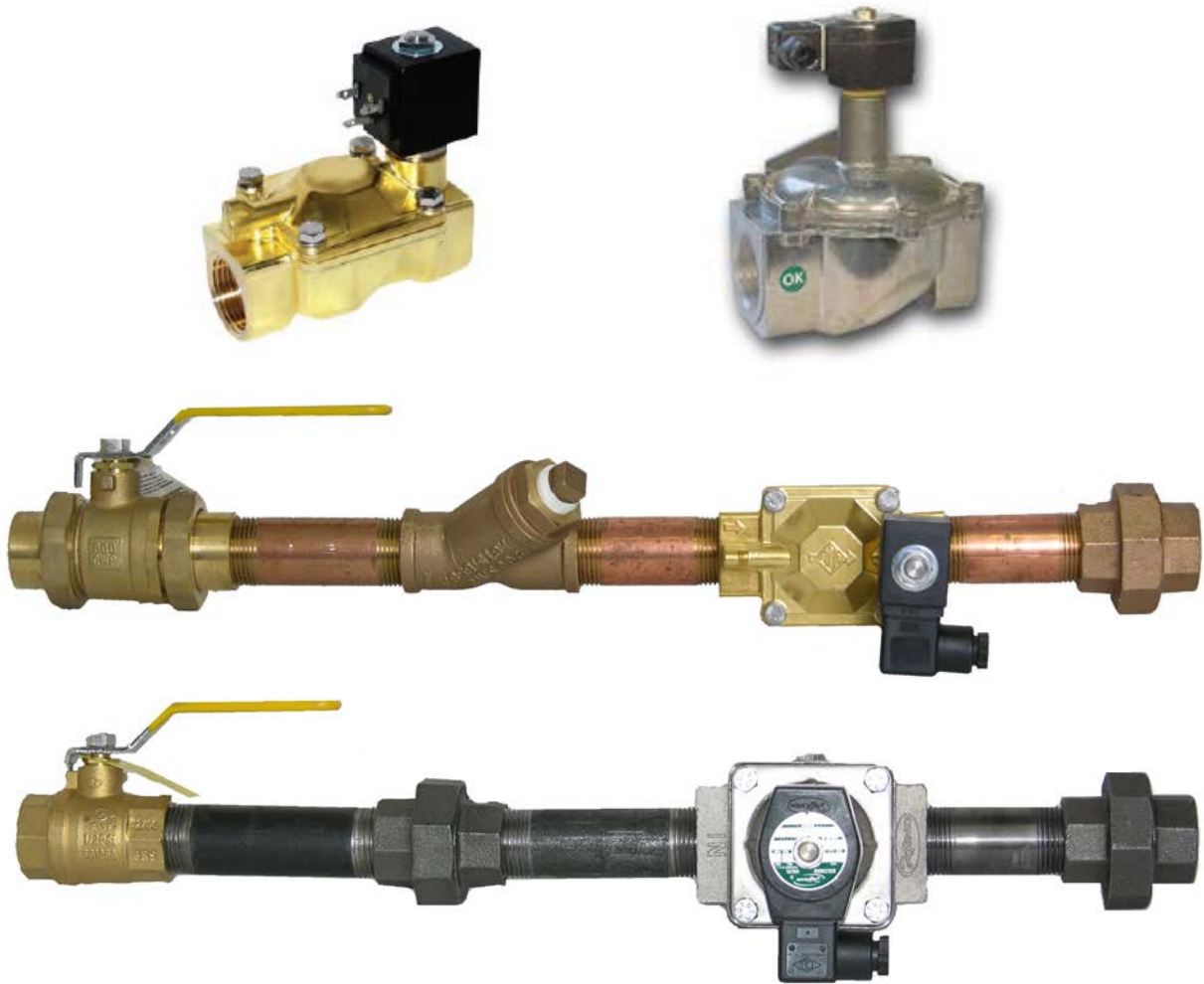


ISIMET

Solenoid & Valve Assembly

Installation and Operation Instructions



Solenoid:

The Stand-Alone Solenoid is provided with the appropriate coil, connector and wiring leads. The Solenoid is intended for use with the *ISIMET* Utility Controller.

Valve Assembly:

The Valve Assembly is a pre-assembled assembly comprised of suitable fittings and nipples including a ball valve, union(s) and solenoid. A Y-strainer and Shock Arrestor is included when optionally selected. The assembly is intended for use with the *ISIMET* Utility Controller.

Note: The installation and mounting procedures described in this manual are intended as a reference guide for recommended techniques. This manual is not intended to prevent alternative means of installation of the Assembly where specific engineered design criteria mandates alternate methods of installation.

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Warranty:

ISIMET will repair or replace solenoids for a period of six (6) months after date of sale. Warranty will be extended to one year where ISIMET Controller that operates the solenoid incorporates an auto shut-down master control. Where solenoids are provided for applications where ISIMET does not provide the operation or control means then warranty is limited to ninety (90) days. All other ISIMET terms, conditions and notices apply.

General Service Solenoids: ISIMET cannot warrant against the effects of hard water, corrosive agents, contaminants, or debris present in the piping system or against effects of exotic or harsh substances.

Damage caused by incorrect installation or improper usage is not warranted. Failure to follow recommended installation, operation, and/or maintenance procedures listed herein may void product warranty. Recovery rights shall be limited to the total sum of the amounts paid for the product by the purchaser.

If the equipment or any part thereof becomes defective within the warranty period, the defective equipment will be replaced or credit allowed therefore at the sole option of ISIMET, but without credit or payment for any labor.

Limits of Liability:

ISIMET's liability shall be limited to costs of repair or replacement parts. The Laboratory Service Panel and Utility Controller are not intended for usage other than those expressly described in this manual. ISIMET shall not be liable for damage or injury caused by the improper use of the product.

ISIMET does not warrant against or assume liability for failure of operation or lack of notification to secondary integrated monitoring systems. The system should be thoroughly tested and adjustments made at time of initial operation. Periodic testing should be conducted by the user to assure that all components function and operate according to specifications.

Care should be taken in the installation of this product. ISIMET shall not be liable for damage or injury caused from the improper installation of the product.

Warranty is Subject to Compliance with Specific Installation Requirements.

DISCLAIMER OF IMPLIED WARRANTY:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION HEREIN. SELLER DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PURPOSE, AND BUYER AGREES THAT THE GOODS ARE SOLD "AS IS."

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Caution:

Pressure testing for fuel gas system solenoids should not exceed 15 psi at the body of this valve due to potential damage caused by excessive pressure applied to the diaphragm. Coils should not be energized unless secured to the valve core. Coils will heat during operation. A temperature of $\pm 150^{\circ}$ is not uncommon.

General Service Solenoids: Where adverse or harsh operating conditions exist in the water system such as the presence of hard water, then it is recommended that only Series 200, 200-SS or 220 Solenoids with 12-VDC latching coils be utilized and that an extensive routine operating and maintenance program be developed by the end user to counter the effects of these conditions. Where operation of water containing corrosive agents, exotic or harsh mediums are intended for control by solenoid then verify application prior to installation. ISIMET cannot warrant against the effects of hard water, corrosive agents, contaminants, or debris present in the piping system or against effects of exotic or harsh substances. If specific operation conditions are in doubt, contact ISIMET prior to installation.

Wiring Information and Instructions: A junction box should be field provided for connection of the factory provided cable or flex conduit of the solenoid. Make proper connection of this cable/conduit and wire leads at the provided junction box.

Caution: Do not route wiring for these Assemblies within conduit containing other wiring.

All local codes must be followed when installing this unit and connecting the conduit to the service panel and making wiring connections. Do not install wiring or cable for integrated systems, remote panic assemblies or other interface wiring within conduit for either 24-vac control or 120-vac line voltage. Each wiring system should be housed in independent conduit and not bundled with wiring for other systems.

Caution: Where an ISIMET Relay Enclosure is provided for intended use with the Assembly then connect appropriate control wiring from Utility Controller output circuits to input posts at termination points in that enclosure.. Where reset fuses are provided at control circuitry for solenoid, having the fuse tripped indicates a malfunction in the operation of the solenoid. Service the solenoid to determine cause of failure, correct problems immediately. Do not bypass reset fuses in circuit.

Notes: Only qualified craftsmen licensed within the governing jurisdiction to perform the work associated with this installation should install and/or service this equipment.

Solenoid Specifications

ISIMET Model	Port Size (in)	Orifice Size (in)	Seat Material	Min. Pressure Diff.	Flow Factor Cv	Operation Pressure		24/60 VAC		120/60 VAC	
						Air/Gas psi	Water psi	VA Inrush	VA Holding	VA Inrush	VA Holding
S-201	1/2	.5	NBR	2	4.8	230	230	25	14.5	25	14.5
S-202	3/4	.75	NBR	2	9.8	230	230	25	14.5	25	14.5
S-203	1	1	NBR	2	14	230	230	25	14.5	25	14.5
S-204	1 1/4	1.375	NBR	2	28	150	150	25	14.5	25	14.5
S-205	1 1/2	1.5	NBR	2	36	150	150	25	14.5	25	14.5
S-206	2	2	NBR	2	53	150	150	25	14.5	25	14.5
S-208	3	3	BUNA	3	77	225	225	-	-	45	27
S-222	3/4	3/4	FKM/NSF	2	9.8	230	230	25	14.5	25	14.5
S-223	1	1	FKM/NSF	2	14	230	230	25	14.5	25	14.5
S-224	1 1/4	1 3/8	FKM/NSF	2	28	150	150	25	14.5	25	14.5
S-225	1 1/2	1 1/2	FKM/NSF	2	36	150	150	25	14.5	25	14.5
S-301	1/2	.71	BUNA	0	4.0	3	171,600 *	45	27	45	27
S-302	3/4	.71	BUNA	0	4.9	3	241,500 *	45	27	45	27
S-303	1	1.26	BUNA	0	1.2	0.75	635,500 *	45	27	45	27
S-304	1 1/4	1.26	BUNA	0	14	0.75	762,700 *	45	27	45	27
S-305	1 1/2	1.89	BUNA	0.015	41	3	2,225,530 *	45	27	45	27
S-306	2	2.0	BUNA	0.015	50	3	2,732,994 *	45	27	45	27
S-308	3	3	NITRILE	0	93.6	45	5,188,000 *	-	-	113	113
S-401	1/2	.5	NBR	2	4.8	230	230	25	14	25	14
S-402	3/4	.75	NBR	2	9.8	230	230	25	14	25	14
S-403	1	1	NBR	2	14	230	230	25	14	25	14
S-501	1/2	.5	BUNA	3	4.2	225	225	12.9	8	-	-
S-502	3/4	.63	BUNA	3	6.4	225	225	12.9	8	-	-
S-503	1	1	BUNA	4.5	10.5	225	225	12.9	8	-	-
S-601	1/2	.625	NBR	0	2.8	TORR@.003	MERC @.00039	25	14.5	25	14.5
S-602	3/4	.625	NBR	0	2.8	TORR@.003	MERC @.00039	25	14.5	25	14.5
S-603	1	1	NBR	0	8.3	TORR@.003	MERC @.00039	25	14.5	25	14.5
S-605	1 1/2	1.89	BUNA	.15	41	TORR@.005	MERC @.00039	45	27	45	27
S-606	2	2.0	BUNA	.15	50	TORR@.005	MERC @.00039	45	27	45	27
S-702	3/4	.75	FKM	0	7	105	-	-	-	267	80
S-703	1	1.02	FKM	0	12	105	-	-	-	267	80
S-705	1 1/2	1.26	FKM	0	18	105	-	-	-	267	80
S-706	2	1.50	FKM	0	27	105	-	-	-	267	80
S-801	1/2	.55	FKM	0	3.1	105	105	57	23	57	23
S-802	3/4	.71	FKM	0	5.03	105	105	57	23	57	23
S-803	1	1.02	FKM	3	13	225	225	45	27	45	27
S-805	1 1/2	1.50	FKM	3	29	225	225	45	27	45	27
S-806	2	1.97	FKM	3	47	225	225	45	27	45	27
S-811	1/2	.55	BUNA	0	3.1	105	105	57	23	57	23
S-812	3/4	.71	BUNA	0	5.03	105	105	57	23	57	23
S-813	1	1.02	BUNA	3	13	225	225	45	27	45	27
S-815	1 1/2	1.50	BUNA	3	29	225	225	45	27	45	27
S-816	2	1.97	BUNA	3	47	225	225	45	27	45	27
S-822	3/4	.79	BUNA	3	5.9	225	225	45	27	45	27
S-823	1	1.02	BUNA	3	13	225	225	45	27	45	27
S-825	1 1/2	1.50	BUNA	3	29	225	225	45	27	45	27
S-826	2	1.97	BUNA	3	47	225	225	45	27	45	27
S-832	3/4	.79	PTFE	7.5	5.9	255	-	45	27	45	27
S-833	1	1.02	PTFE	7.5	13	255	-	45	27	45	27
S-835	1 1/2	1.5	PTFE	7.5	29	255	-	45	27	45	27
S-836	2	1.97	PTFE	7.5	47	255	-	45	27	45	27

- *BTU @ 0.60 Specific Gravity W/pressure drop of 0.5inch water column
- Vacuum is rated @ TORR and inches of Mercury
- For Stainless Steel – Refer to S-200 Series Specifications

Solenoid Specifications (Continued):

- 200 Series – General Service N/C – Brass Valve Body
- 200-SS Series – General Service N/C – Stainless Steel Valve Body
- 220 Series – General Service N/C – Lead Free Brass Valve Body
- 300 Series – Fuel Gas N/C – Aluminum Valve Body
- 400 Series – General Service N/O – Brass Valve Body
- 500 Series – Low Wattage General Purpose N/C – Brass Valve Body
- 600 Series – Vacuum N/C – Brass Valve Body
- 700 Series – Fuel Oil N/C – Bronze Valve Body
- 800 Series – Oxygen/Acetylene/Argon/CO2/Nitrous Oxide N/C – Brass Valve Body
- 810 Series – Hydrogen/Nitrogen N/C – Brass Valve Body
- 820 Series – High Pressure Gas N/C – Brass Valve Body
- 830 Series – Helium N/C – Brass Valve Body

Ball Valve Specifications:

Apollo or Nibco Bronze 2-Piece Ball Valve. (or equivalent)

All valves are full port, bronze

Valve Station Suffix:

“TUT” – General Service Double -Threaded Union (Through 1”) **600 psi CWP MSS SP-110**

“TU” – General Service Threaded Union **150 psi SWP 600 psi CWP MSS SP-110**

“XU” – Non-Union **150 psi SWP 600 psi CWP MSS SP-110**

“FB” – General Service Non-Union W/ integral 20 mesh strainer (Jomar Mfg.) (1/2” – 2”) **150 psi WSP 400 psi WOG**

FB & TUT Non Lead Free only – TUT will be phased out by Mid-Summer

Valves for fuel gas systems are UL Listed but are not available with the integral output union or strainers (XU) only.

Valves greater than 2” only available in “XU”

Recommend the use of Series 220 for all domestic water systems.

1/2” & 2” Lead Free Solenoids are Currently Not Available. Recommend use of S-200-SS for these applications.

S-301 – S-304 & S-308 are 0 Differential; S-305 & S-306 are 0.015 psi Differential.

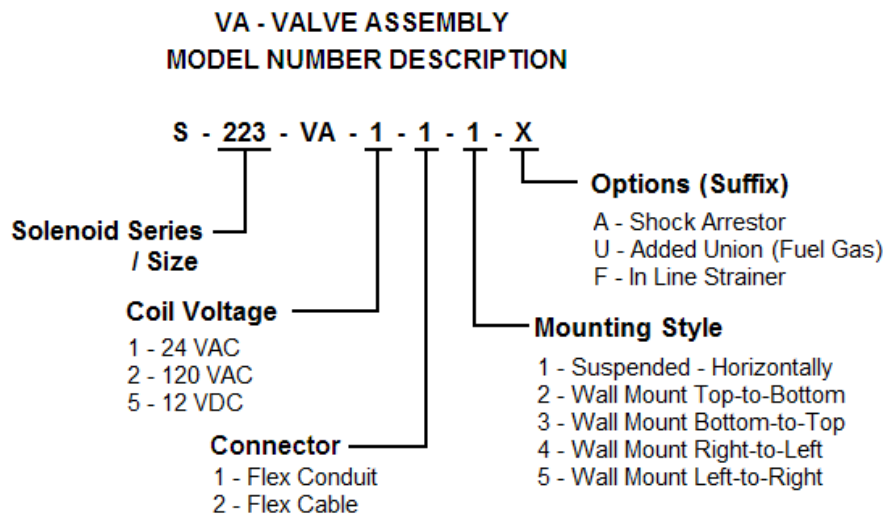
Caution should be used if S-305 and S-306 solenoids are used in science lab applications.

Valve Assembly Configuration and Typical Mounting:

The image of the Assembly is generic and may not represent the actual assembly provided with this manual. Valves, Solenoids, and Strainers are arranged and positioned per specifications provided at the time of order.

Field provided strut, clamps, hangers and hardware meeting industry and project specific standards should be utilized when mounting the Assembly. Mounting technique should meet those same standards.

CAUTION: The structural member and/or wall to which the Assembly is to be suspended or mounted should be of sufficient strength to support the entire weight of the Assembly, connected piping and mounting hardware. All mounting hardware is field provided. Suspension and/or mounting means and methods should meet the most stringent of industry standards as well as comply with project specific requirements.



Caution:

1. Pressurized Devices

This equipment is a pressure containing device.

- Do not exceed maximum operating pressure.
- Do not exceed max. during testing of the piping system.
- Make sure equipment is depressurized before working on or disassembling it for service.

2. Electrical

This equipment requires electricity to operate.

- Install equipment in compliance with national and local electrical codes.
- Standard equipment is supplied with NEMA 1 electrical enclosures and is not intended for installation in hazardous environments.
- **Disconnect power supply to equipment when performing any electrical service work.**

3. Fuses

When solenoids are provided with fuse holder, this device should be included in field wiring circuitry. Replacement fuses should not exceed rating stated on the solenoid.

A. INSTALLATION

- a.1. Before mounting the valve, it is essential to check that the solenoid valve or valve assembly model number, the voltage (Volt) and the frequency (Hz) correspond to the characteristics required.
- a.2. Solenoids should not be mounted in an inverted position.
- a.3. 3" solenoids should have coils in verticle, upright position.

B. MECHANICAL PART

- b.1. Assembly of the solenoid valve must correspond with the flow direction indicated with an arrow on the valve body.
- b.2. If the valves are provided with caps for protecting the connections, make sure they are removed before assembly.
- b.3. Care should be taken to prevent foreign bodies from entering the valve during the assembly phase, e.g. material chips, dirt or particles of insulating material, such as the PTFE tape from the "external thread" connections.
- b.4. Although the valve can be used in any position, the inverted position is prohibited since possible impurities could become blocked inside the core tube causing malfunctioning.
- b.5. When installing the valve, make sure that the position and surrounding space are sufficient to allow for possible future maintenance or replacement of the coil.
- b.6. Never use a part of the core tube or the coil itself as a lever during the tightening phase. This could cause irreparable damage to the valve.
- b.7. In those installations where impurities, slag or deposits of various types may infiltrate the fluid, it is recommended to mount a filter upstream of the valve.
- b.8. Particular attention should be paid to the temperatures when installing valves with connections welded.
- b.9. When carrying out welding between the valve connection and the pipe of the system, it is necessary to dismantle the coil and check that the temperature of the valve body does not exceed values of 100 - 150°C (200 - 300°F).
The flames should be regulated so that it does not come into contact with the valve. The body of the latter should be cooled by wrapping it in wet cloth.
Should it be impossible to carry out these precautions, we suggest dismantaling the parts inside the valve.

C. ELECTRICAL CONNECTIONS

- c.1. Before connecting the coil to the supply system, make sure that the characteristics conform to the supply voltage.
- c.2. Where applicable, the earth terminals must be connected.
- c.3. The coil should not be energized before being installed on the valve since this could cause it to burn out.
- c.4. Rotate the coil to the most suitable position, loosening and subsequently tightening the upper nut.

D. WORKING TEMPERATURE

- d.1. It is normal for the coil temperatue to increase during operation; irregular overheating will cause smoke and a smell of burning. In this case, the supply must be immediately isolated.
- d.2. Care should be taken to not install the valve near sources of heat or in environments where there could be a dissipation of the heat produced by the coil.

E. MAINTENANCE

Refer to Solenoid Maintenance Document for recommended service requirements.

12 VDC Wiring Note:

Solenoids provided with a 12 VDC coil are intended for use only with ISIMET Controllers with 12 VDC outputs. Output labels on the Controller are color coded as are the wire leads to each solenoid. It is imperative that solenoids be connected to piping services as intended and with the correct flow direction. Wiring from the Controller's output terminal to the solenoids should be done in a manner that insures that the white lead at the solenoid is connected to the white pin at the output terminal. The black wires should likewise match. Failure to precisely install and wire the solenoids per these instructions will cause the system to fail.

Piping Connection Note:

When making service piping connections, provide back-up restraint at the assembly so as to prevent the turning of the valve assemblies. Disrupting the factory piping connections may cause leakage.

Testing & Cleaning the Piping System:

The piping system should be thoroughly tested and cleaned of all foreign matter and debris prior to placing the valve and piping systems into service. Unions are provided loose fit. Inlets and outlets are plugged to prevent debris from entering the piping assembly.

The piping joints on the Valve Assembly should be tested to assure tight connections. Do not exceed 15 psi test on any fuel gas system solenoid from upstream. Damage to the coil may result when first energized if testing is greater than 15 psi.

Caution: All local codes and regulations should be followed when installing the assembly and making the piping connections.

Special Placements and Arrangement of the Valve Assembly:

The use of industry standard support assemblies including threaded rod, strut channel and structural angle is recommended when supporting the Valve Assembly by means other than described previously in this manual. *ISIMET* recommends that good industry practices be followed and that the support of the Assembly and integral piping assemblies be separate from the support of the field installed piping systems. Do not support the Assembly directly from the connected piping. Installation should not inhibit access to the valve assemblies for the purpose of routine maintenance.

3" Solenoids **MUST** be mounted so that the coil rests in a full upright position.

Routine Maintenance:

Periodic examination and testing of the piping system should be performed to assure that the solenoids are functioning properly and that no foreign debris has lodged in the solenoid valve orifice, preventing the proper operation of the valve.

CAUTION:

ISIMET DOES NOT recommend that service to emergency and/or safety devices, such as emergency showers and eyewashes, be controlled by the Utility Controller System or Solenoids. Such devices are intended to operate independent of restrictive authority operation as is the case with the design of this unit. Power to the solenoids should be turned OFF when utilities are not in service.

ISIMET makes available components for the monitoring of such safety devices. Please contact *ISIMET* regarding any questions regarding this type of application.

Notice:

Piping system should be thoroughly flushed prior to operation. If systems are operated without proper flushing, the solenoid diaphragm may become fouled and may not close properly when solenoid coil is disengaged. ISIMET recommends providing in-line strainers immediately upstream of the solenoid for all fluid delivery systems, and where debris or harsh conditions are anticipated. ISIMET also recommends that shock arrestors be provided where water hammer is anticipated or when stated in the project specifications.



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