AIRSWEEP®

MATERIAL ACTIVATION SYSTEMS

Flu-Tech Fluid Control Specialists

บริษัท ฟลูเทค จำกัด
Flu-tech co.,ltd

Installation and Maintenance Manual

AirSweep® Models:

VA-06

VA-12

VA-51

VA-06-316-TRI-TRI

VA-12-316-TRI-TRI

Straight Shooter

WWW.FLUTECH.CO.TH

ADD FRIEND @flutech.co.th

FLU-TECH CO.,LTD | บริษัท ฟลูเทค จำกัด

845/3-4 M.3 , Theparak, Muang, Samutprakan 10270

845/3-4 หมู่ 3 ถ.เทพารักษ์ ต.เทพารักษ์ อ.เมือง จ.สมุทรปราการ 10270

Table of Contents

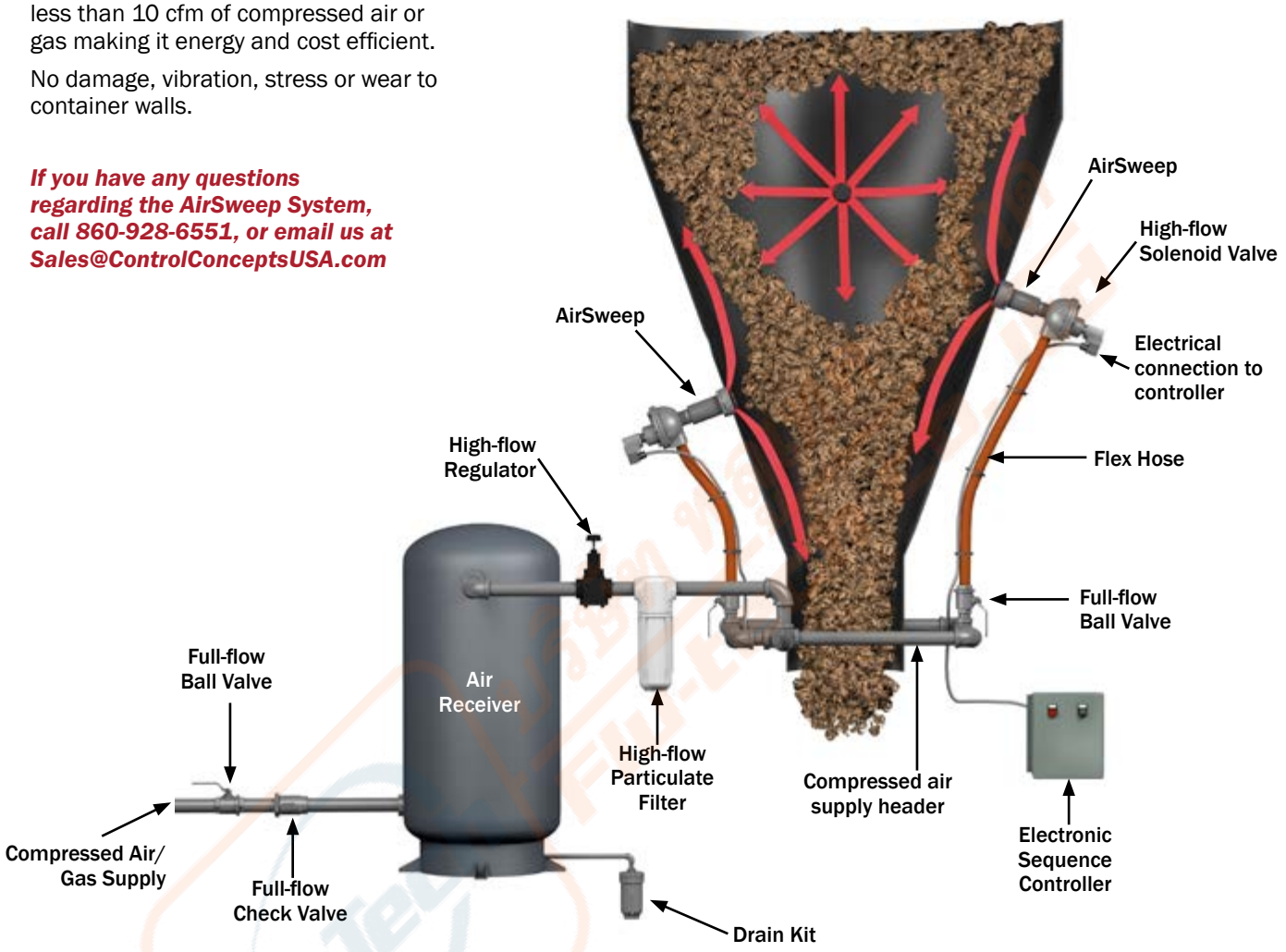
Typical AirSweep® System

A typical AirSweep® material activation system consists of strategically-located AirSweeps, high-flow solenoid valves, electronic sequence controller and air receiver.

The average AirSweep® System uses less than 10 cfm of compressed air or gas making it energy and cost efficient.

No damage, vibration, stress or wear to container walls.

If you have any questions regarding the AirSweep System, call 860-928-6551, or email us at Sales@ControlConceptsUSA.com



Typical AirSweep® System Components

Component	Model VA-06	Model VA-12	Model VA-51	Description
Solenoid Valve	✓	✓	✓	Delivers rapid, high-volume pulse of compressed air/gas to AirSweep nozzle.
Flex Hose Assembly	✓	✓	✓	Connects the solenoid valve to hard-piped header loop.
Full-flow Ball Valve	3/4"	1-1/2"	1-1/2"	Isolation valve for individual nozzles.
High-flow Particulate Filter	1"	1-1/2"	2"	Point-of-use particulate filtration enhances life of system components by removal of in-line contaminants.
Air Receiver	30-gallon	60-gallon	80-gallon	Compressed air reservoir ensures instantaneous volume for system.
High-flow Regulator	1"	1-1/2"	2"	Regulates compressed air supply for proper AirSweep operation.
Full-flow Check Valve	1"	1-1/2"	2"	Ensures one-way flow to system.
Full-flow Ball Valve	1"	1-1/2"	2"	System shut-off.
Electronic Sequence Controller	✓	✓	✓	Controls sequenced pulsing of AirSweep system; adjustable for any process.

AIRSWEEP® INSTALLATION NOTES

Consult installation drawing (if provided) for proper AirSweep location. It is important to adhere to the recommended locations as the type, number and location of AirSweeps have been selected for thorough "sweep" coverage of problem surfaces in the vessel or chute.

It is usually not necessary to clean out or empty the vessel before installing the AirSweeps. Even if a "crust" of material has built up inside the vessel, the air blasts will generally cut it away from the vessel wall over a period of time. Consequently, the "crust" sometimes breaks away in chunks, and it is possible that these chunks will clog the discharge. If clogging occurs, the vessel should be cleaned manually prior to start up.

CAUTION: NEVER ENTER A VESSEL WHILE AIRSWEEPS ARE OPERATING

If the material in the vessel has a tendency to run out of a hole cut in the vessel wall, the level of material in the vessel should be dropped below the AirSweep location before cutting the holes in the vessel wall.

When welding, a continuous bead should be used to fasten the mounting to the vessel wall on steel vessels. Anchor bolts can be set in concrete vessel walls to coincide with the bolt hole pattern of the mounting plate or flange so that the mounting can be bolted to the wall.

Alert: Welding procedure must be done properly to avoid warping of Mounting Coupling.

Welding should be done in accordance with the American Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).

PIPING INSTALLATION

It is suggested that you follow the piping schematic that is a part of this instruction manual. (See pg 2)

Never use smaller pipe size fittings or valves than the ones shown.

It is important that the header be installed below the level of the AirSweeps so that any condensation that may form in the lines will not drain into the AirSweeps. If the header must be installed above the level of installed AirSweeps, the feed lines for the individual AirSweeps must be taken off the top of the header (rather than the bottom) to minimize condensation drainage into the AirSweeps and solenoids. A full flow gate or ball valve is recommended as it allows one AirSweep to be taken out of service without shutting down the entire system.

Using flexible air hose in lieu of rigid piping from the header to the solenoids is recommended for ease of installation and for easy removal of the AirSweep when service is required.

NOTE: USING SUITABLE SAFEGUARDS – Always blow out all air supply lines thoroughly before final hook up to solenoids. Dirt in supply lines may cause the solenoid valves to malfunction.

When operating properly, with material in the vessel, the AirSweeps are almost silent. If an AirSweep begins to chatter, vibrate or "machine gun", it is generally caused by a malfunctioning solenoid valve, often due to dirt. If this occurs, **SHUT OFF ELECTRIC & AIR SUPPLY** and **DISCHARGE AIR** in system, then clean solenoid thoroughly *(see Troubleshooting on page 42)*.

AIR USAGE NOTE

It is important to note that the lower limit of the interval timer is governed by how fast the air receiver can recover its air loss from the preceding AirSweep burst. If there is some doubt, a gauge should be installed on the air receiver tank or header. For example, if the gauge initially reads 95 psi when the receiver is fully pressurized, it should not drop below 80 psi for one burst if the receiver has been properly sized. The instant the receiver again recovers the 95 psi after one AirSweep is fired, it is then ready for another firing. If the gauge never indicates the original pressure, the AirSweeps are firing faster than the air supply can recover.

GENERAL NOTES & SUMMARY:

- For personal safety, the entire electrical system must be properly grounded.
- Distance between air receiver and header has no limit, as long as 2" pipe (1" for VA-06) and fittings are used throughout.
- Slope header toward receiver 1/4" per ft. for moisture drainage. Whenever possible, locate header below AirSweeps.
- Always tap feed lines off top of header (even if header is above AirSweeps) to prevent moisture drainage into solenoid valves and AirSweeps.
- Never use pipe or fittings smaller than sizes indicated.
- Use location arrangement drawing (if provided) for AirSweep location.
- Whenever possible, complete header loop around the hopper.
- Manual isolation valves (optional) must be gate valves or comparable full orifice valves, to not induce flow restriction in system.
- If vessel is outdoors, air receiver and filter should be located indoors whenever possible.
- Use of a check valve is recommended if plant air pressure varies more than 10 psi.
- Air Supply: VA-12 & VA-51 – 80 minimum to 100 maximum psig
  VA-06 – 40 minimum to 60 maximum psig
- **IMPORTANT!** Solenoid valves must be located at AirSweep air inlets and not any distance upstream.
- Purge all lines and unions before connecting to solenoid valves. Particulate in lines may result in solenoid valve malfunction and excessive maintenance.
- Use PTFE tape on pipe joints rather than pipe dope, to avoid fouling of solenoid valves.

VA-51-NPT-TB

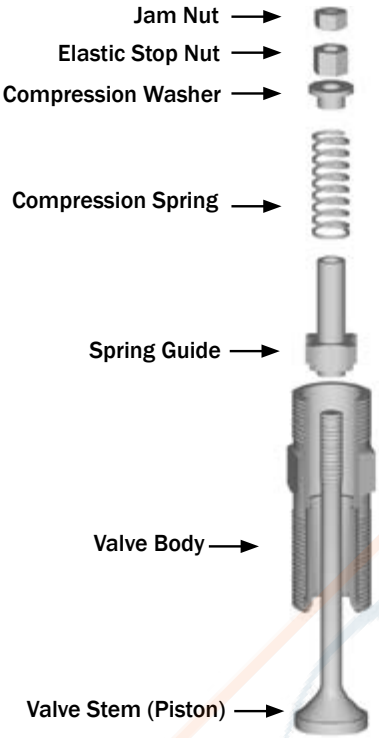
2" AirSweep® Assembly and Mounting Options

Lock Nut

Mounting Options

Mounting Coupling
(Weld to vessel)

Mounting Flange
(Bolt to vessel)



Part Number per Material of Construction

Qty.	Description	Carbon Steel	304 Stainless Steel	316 Stainless Steel
1	Valve Body	VB-51-CS	VB-51-SS	VB-51-316
*1	Valve Stem	VCW-51-CS	VCW-51-SS	VCW-51-316
*1	Spring Guide	SG-51-CS	SG-51-SS	SG-51-316
*1	Compression Spring	CS-1251-316	CS-1251-316	CS-1251-316
*1	Compression Washer	CW-1251-316	CW-1251-316	CW-1251-316
*1	Elastic Stop Nut	ESN-1251-CS	ESN-1251-SS	ESN-1251-SS
*1	Jam Nut	JN-1251-CS	JN-1251-SS	JN-1251-SS
1	Mounting Flange	MF-51-CS-T	MF-51-SS-T	MF-51-316-T
1	Mounting Coupling	MC-51-CS-T	MC-51-SS-T	MC-51-316-T
1	Lock Nut	LN-51-CS	LN-51-SS	LN-51-316

**** This part is included in the Rebuild Kit.***

Model VA-51 Rebuild Kit

AirSweep Nozzle Rebuild Kit contains 1 each:

- valve stem
- spring guide
- compression washer
- compression spring
- elastic stop nut
- jam nut

Recommended service interval of internal parts:
Approximately 1 million cycles.*

Maintenance recommended:
Replacement of internal parts.

When ordering, specify material of construction.		Model VA-51 Rebuild Kit
Construction Material	Carbon Steel	RK-51-CS
	304 Stainless Steel	RK-51-SS
	316 Stainless Steel	RK-51-316

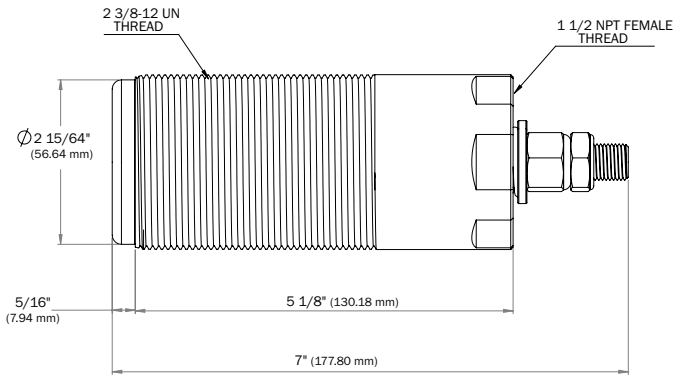
** Typical service interval under standard operating conditions. Some environments, materials and processes may result in a shorter useful service interval.*

VA-51-NPT-TB

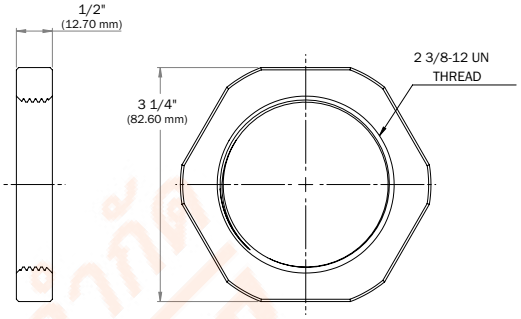
2" AirSweep® Specification Drawings

Specifications subject to change without notice.

VA-51-NPT-TB

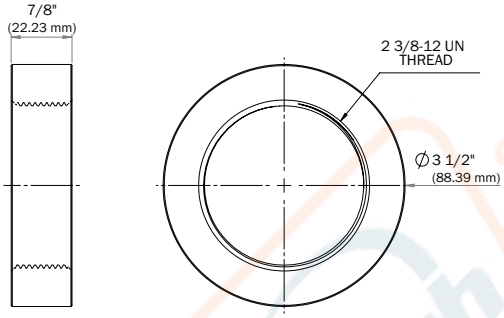


Lock Nut

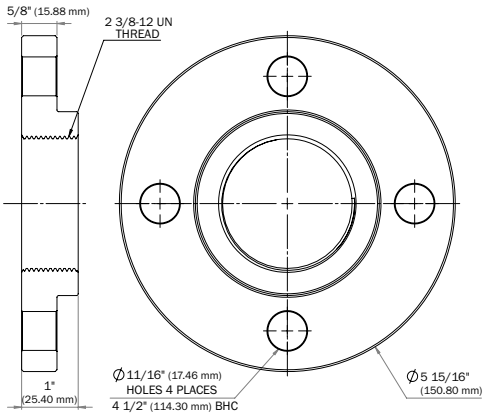


Mounting Options

Mounting Coupling
(Weld to vessel)



Mounting Flange
(Bolt to vessel)



Standard materials of construction include:

- **Carbon Steel**
- **304 Stainless Steel**
- **316 Stainless Steel**

Other materials available upon request.

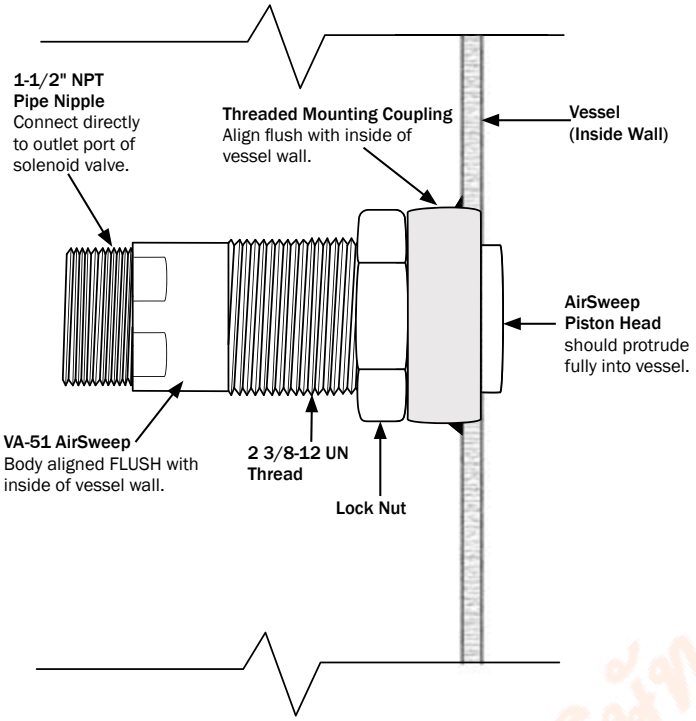
VA-51 Performance (per unit)*	
Material Activation Diameter	**Compressed Air/Gas Consumption (per pulse)**
6 feet (1.83 m)	2.18 scf @ 80 psi (0.062 m^3 @ 5.52 bar)
8 feet (2.44 m)	2.99 scf @ 100 psi (0.085 m^3 @ 6.89 bar)

** Average in 75 lbs/ft^3 material; 250 millisecond pulse.*

VA-51-NPT-TB

Mounting Installation

MC-51 Mounting Coupling Installation (Weld to vessel)



* *Welding procedure must be done properly to avoid warping of Mounting Coupling. Welding should be done in accordance with the American Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).*

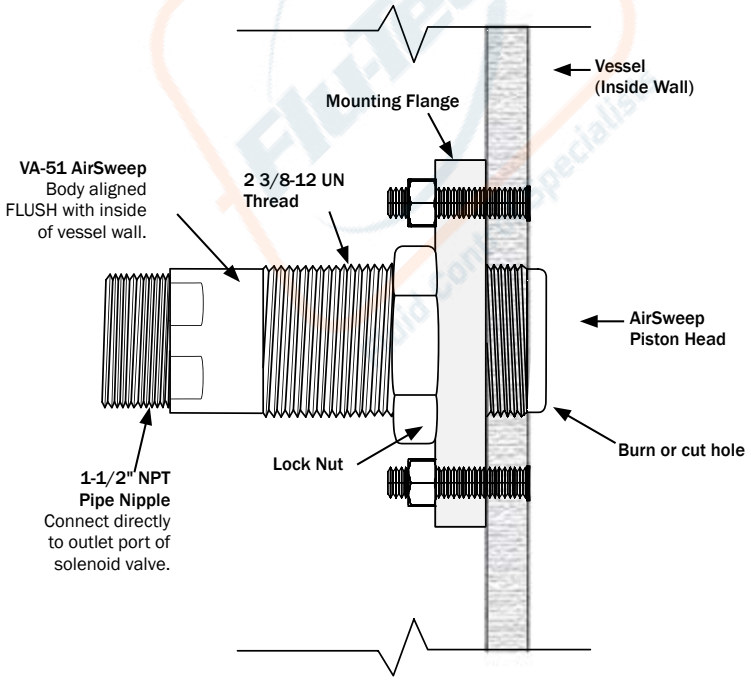
MC-51 Mounting Coupling Installation

1. Cut hole in vessel wall. Recommended hole size is approximately 1/8" (3.175 mm) greater than diameter of coupling to allow coupling to pass through curved wall. The MC-51 mounting coupling is 3-1/2" (88.9 mm) dia., therefore the recommended hole size is 3-5/8" (92.075 mm).
2. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall.*****
3. Apply anti-seize compound to front threaded section of AirSweep. Thread AirSweep into position so the front of the body is aligned with the front of coupling. This will properly position the piston head within the vessel.
4. After the position of the AirSweep is determined to be correct, tighten the lock collar against the coupling to keep the AirSweep in position.

Note: *On sharply curved bin walls, the body of AirSweep will extend slightly into the vessel at the top and bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).*

- For maximum effectiveness, connection distance between AirSweep and solenoid valve should be as short as possible. Use only the supplied connecting nipple with no additional elbows or pipe, if possible.

MF-51 Mounting Flange Installation (Bolt to vessel)



MF-51 Mounting Flange Installation

1. Position flange on wall surface. Mark hole for AirSweep. Mark bolt circle layout.
2. Drill or cut hole for AirSweep and bolt holes. The hole size should be sufficient diameter to allow AirSweep to pass through wall.
3. Fasten flange to wall by bolting.
4. Apply anti-seize compound to front threaded section of AirSweep. Thread the AirSweep into position so that the front of the AirSweep body is aligned with the inside wall of vessel. This will properly position piston head within the vessel.
5. After the AirSweep is correctly positioned, tighten lock nut against flange to keep AirSweep in position.

VA-12-NPT-TB

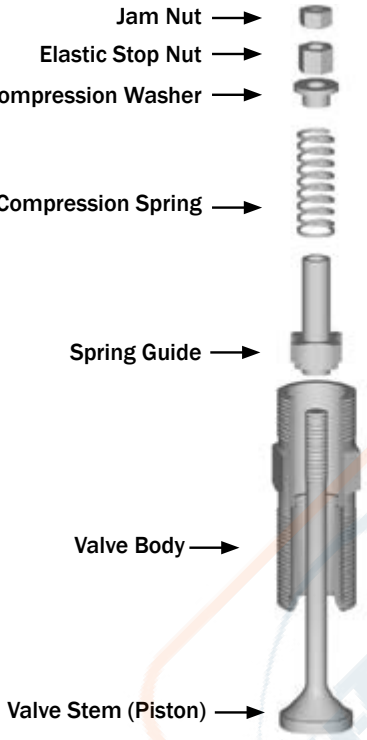
1-1/2" AirSweep® Assembly and Mounting Options

Lock Nut

Mounting Options

Mounting Coupling
(Weld to vessel)

Mounting Flange
(Bolt to vessel)



Part Number per Material of Construction

Qty.	Description	Carbon Steel	304 Stainless Steel	316 Stainless Steel
1	Valve Body	VB-12-CS	VB-12-SS	VB-12-316
*1	Valve Stem	VCW-12-CS	VCW-12-SS	VCW-12-316
*1	Spring Guide	SG-12-CS	SG-12-SS	SG-12-316
*1	Compression Spring	CS-1251-316	CS-1251-316	CS-1251-316
*1	Compression Washer	CW-1251-316	CW-1251-316	CW-1251-316
*1	Elastic Stop Nut	ESN-1251-CS	ESN-1251-SS	ESN-1251-SS
*1	Jam Nut	JN-1251-CS	JN-1251-SS	JN-1251-SS
1	Mounting Flange	MF-12-CS-T	MF-12-SS-T	MF-12-316-T
1	Mounting Coupling	MC-12-CS	MC-12-SS	MC-12-316
1	Lock Nut	LN-12-CS	LN-12-SS	LN-12-316

**** This part is included in the Rebuild Kit.***

Model VA-12 Rebuild Kit

AirSweep Nozzle Rebuild Kit contains 1 each:

- valve stem
- spring guide
- compression washer
- compression spring
- elastic stop nut
- jam nut

When ordering, specify material of construction.		Model VA-12 Rebuild Kit
Construction Material	Carbon Steel	RK-12-CS
	304 Stainless Steel	RK-12-SS
	316 Stainless Steel	RK-12-316

Recommended service interval of internal parts:
Approximately 1 million cycles.*

Maintenance recommended:
Replacement of internal parts.

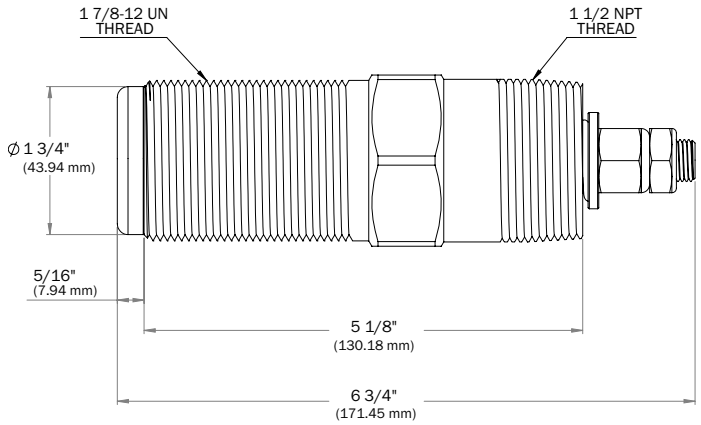
** Typical service interval under standard operating conditions. Some environments, materials and processes may result in a shorter useful service interval.*

VA-12-NPT-TB

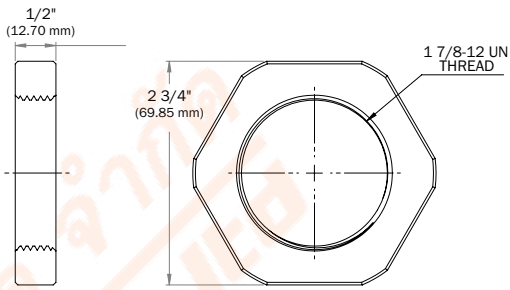
1-1/2" AirSweep® Specification Drawings

VA-12-NPT-TB

Specifications subject to change without notice.

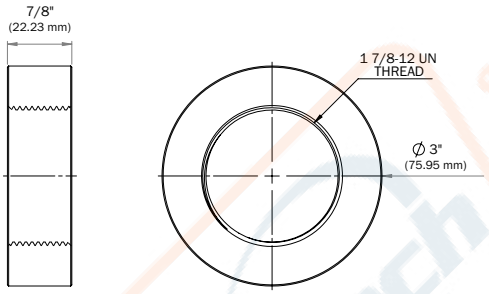


Lock Nut

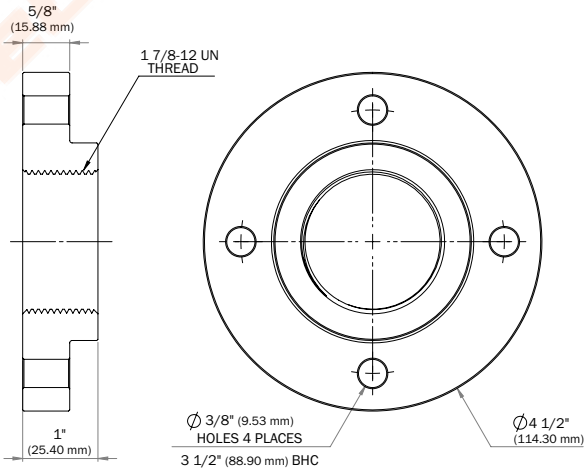


Mounting Options

Mounting Coupling
(Weld to vessel)



Mounting Flange
(Bolt to vessel)



Standard materials of construction include:

- Carbon Steel
- 304 Stainless Steel
- 316 Stainless Steel

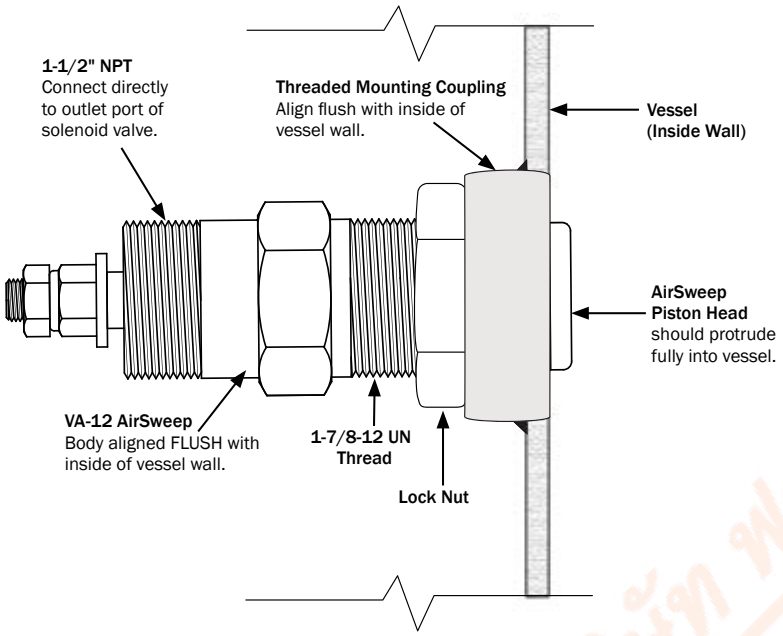
Other materials available upon request.

VA-12 Performance (per unit)*	
Material Activation Diameter	**Compressed Air/Gas Consumption (per pulse)**
6 feet (1.83 m)	1.9 scf @ 80 psi (0.054 m^3 @ 5.52 bar)
8 feet (2.44 m)	2.45 scf @ 100 psi (0.069 m^3 @ 6.89 bar)

**Average in 75 lbs/ft^3 material; 250 millisecond pulse*

VA-12-NPT-TB
Mounting Installation

MC-12 Mounting Coupling Installation (Weld to vessel)



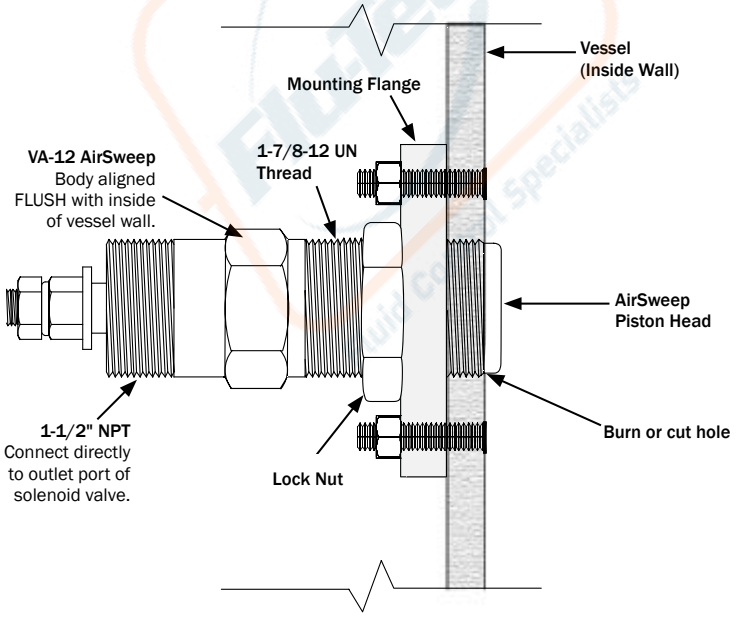
MC-12 Mounting Coupling Installation

1. Cut hole in vessel wall. Recommended hole size is approximately 1/8" (3.175 mm) greater than diameter of coupling to allow coupling to pass through curved wall. The MC-12 mounting coupling is 3" (76.2 mm) dia., therefore the recommended hole size is 3-1/8" (79.375 mm).
2. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall.*
3. Apply anti-seize compound to front threaded section of AirSweep. Thread AirSweep into position so the front of the body is aligned with the front of the coupling. This will properly position the piston head within the vessel.
4. After the AirSweep is correctly positioned, tighten lock nut against coupling to keep AirSweep in position.

Note: *On sharply curved vessel walls, the body of AirSweep will extend slightly into the bin at the top and bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).*

* *Welding procedure must be done properly to avoid warping of Mounting Coupling. Welding should be done in accordance with the American Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).*

MF-12 Mounting Flange Installation (Bolt to vessel)

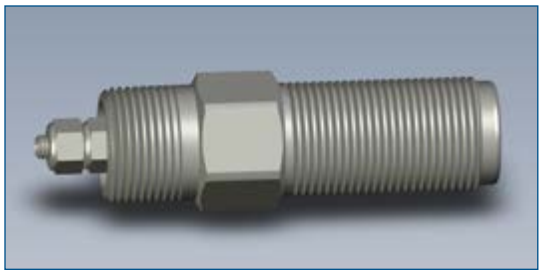


MF-12 Mounting Flange Installation

1. Position flange on wall surface. Mark hole for AirSweep. Mark bolt circle layout.
2. Drill or cut hole for AirSweep and bolt holes. The hole size should be sufficient diameter to allow AirSweep to pass through wall.
3. Fasten flange to wall by bolting
4. Apply anti-seize compound to front threaded section of AirSweep. Thread the AirSweep into position so that the front of the AirSweep body is aligned with the inside wall of vessel. This will properly position piston head within the vessel.
5. After the AirSweep is correctly positioned, tighten lock nut against flange to keep AirSweep in position.

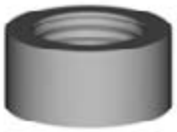
VA-06-NPT-TB

3/4" AirSweep® Assembly and Mounting Options



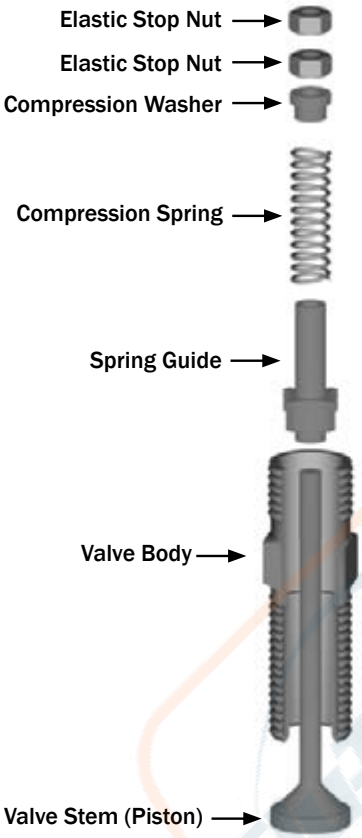
Lock Nut

Mounting Options



Mounting Coupling
(Weld to vessel)

Mounting Plate
(Bolt to vessel)



Part Number per Material of Construction

Qty.	Description	Carbon Steel	304 Stainless Steel	316 Stainless Steel
1	Valve Body	VB-06-CS	VB-06-SS	VB-06-316
*1	Valve Stem	VCW-06-CS	VCW-06-SS	VCW-06-316
*1	Spring Guide	SG-06-SS	SG-06-SS	SG-06-316
*1	Compression Spring	CS-06-316	CS-06-316	CS-06-316
*1	Compression Washer	CW-06-316	CW-06-316	CW-06-316
*2	Elastic Stop Nut	ESN-06-CS	ESN-06-SS	ESN-06-SS
1	Mounting Plate	MP-06-CS-T	MP-06-SS-T	MP-06-316-T
1	Mounting Coupling	MC-06-CS-T	MC-06-SS-T	MC-06-316-T
1	Lock Nut	LN-06-CS	LN-06-SS	LN-06-316

** This part is included in the Rebuild Kit.*

Model VA-06 Rebuild Kit

AirSweep Nozzle Rebuild Kit contains 1 each:

- valve stem
- spring guide
- compression washer
- compression spring
- two (2) elastic stop nuts

Recommended service interval of internal parts:
Approximately 1 million cycles.*

Maintenance recommended:
Replacement of internal parts.

When ordering, specify material of construction.		Model VA-06 Rebuild Kit Part No.
Construction Material	Carbon Steel	RK-06-CS
	304 Stainless Steel	RK-06-SS
	316 Stainless Steel	RK-06-316

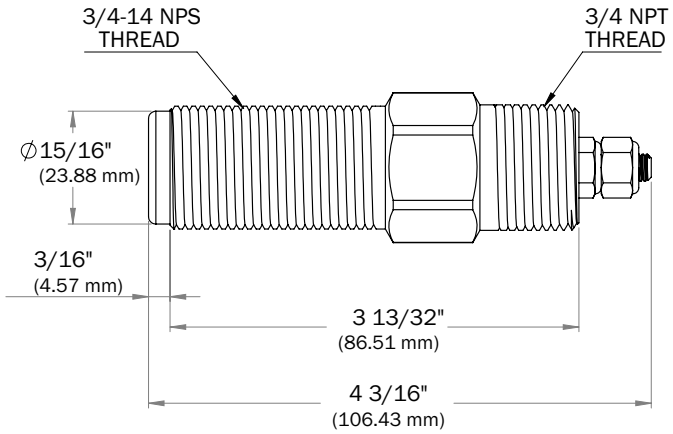
** Typical service interval under standard operating conditions. Some environments, materials and processes may result in a shorter useful service interval.*

VA-06-NPT-TB

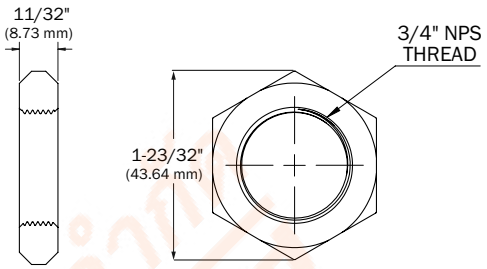
3/4" AirSweep® Specification Drawings

VA-06-NPT-TB

Specifications subject to change without notice.

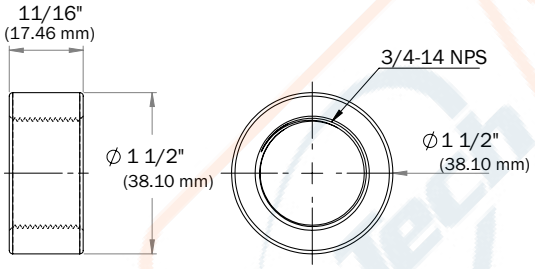


Lock Nut

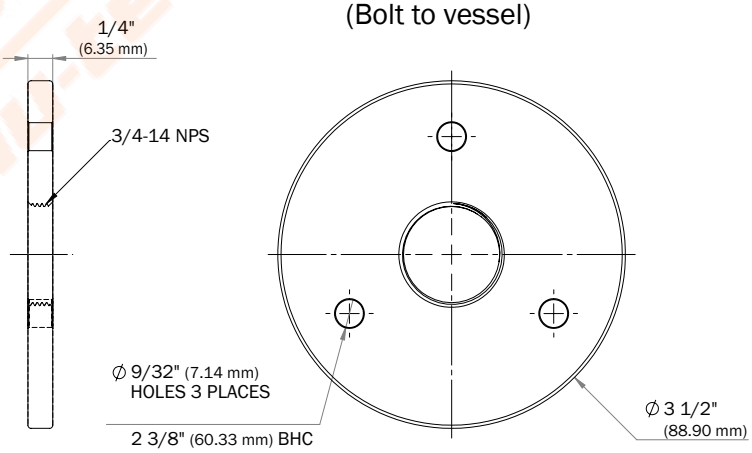


Mounting Options

Mounting Coupling
(Weld to vessel)



Mounting Plate
(Bolt to vessel)



Standard materials of construction include:

- **Carbon Steel**
- **304 Stainless Steel**
- **316 Stainless Steel**

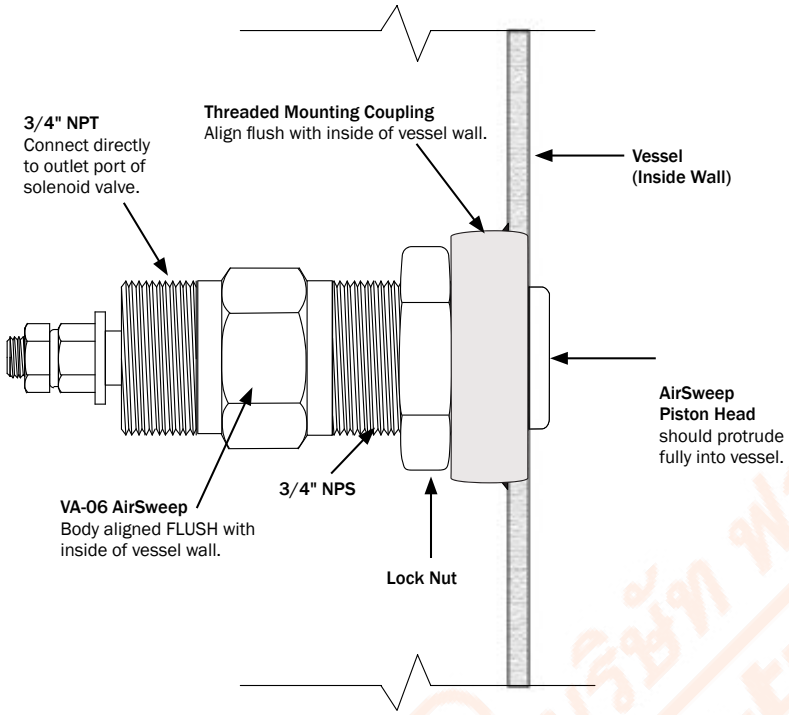
Other materials available upon request.

VA-06 Performance (per unit)*	
Material Activation Diameter	**Compressed Air/Gas Consumption (per pulse)**
2 feet (0.61 m)	0.08 scf @ 40 psi (0.002 m^3 @ 2.76 bar)
3 feet (0.91 m)	0.45 scf @ 60 psi (0.013 m^3 @ 4.14 bar)

**Average in 75 lbs/ft^3 material; 250 millisecond pulse.*

VA-06-NPT-TB
Mounting Installation

MC-06 Mounting Coupling Installation (Weld to vessel)



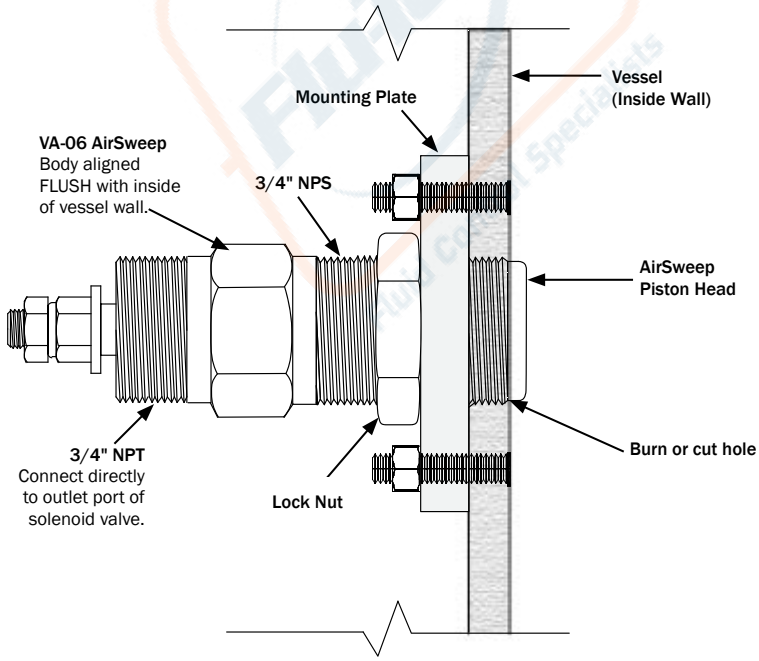
MC-06 Mounting Coupling Installation

1. Cut hole in vessel wall: Recommended hole size is approximately 1/8" (3.175 mm) greater than diameter of coupling to allow coupling to pass through curved wall. The MC-06 mounting coupling is 1-1/2" (38.1 mm) dia., therefore the recommended hole size is 1-5/8" (41.275 mm).
2. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall.*
3. Apply anti-seize compound to front threaded section of AirSweep. Thread AirSweep into position so the front of the body is aligned with the front of the coupling. This will properly position the piston head within the vessel.
4. After the AirSweep is correctly positioned, tighten lock nut against coupling to keep AirSweep in position.

Note: *On sharply curved vessel walls, the body of AirSweep will extend slightly into the bin at the top and bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).*

* *Welding procedure must be done properly to avoid warping of Mounting Coupling. Welding should be done in accordance with the American Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).*

MP-06 Mounting Plate Installation (Bolt to vessel)



MP-06 Mounting Plate Installation

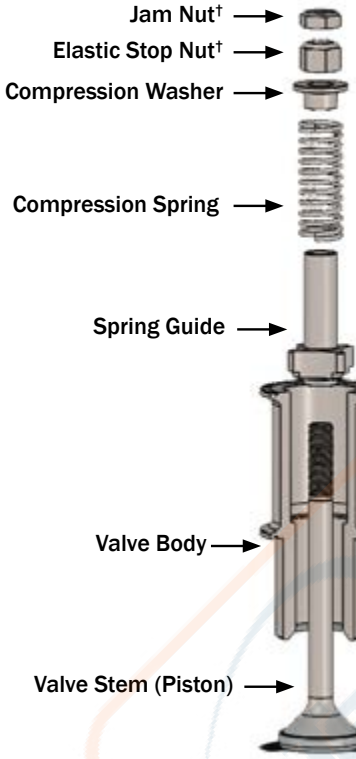
1. Position plate on wall surface. Mark hole for AirSweep. Mark bolt circle layout.
2. Drill or cut hole for AirSweep and bolt holes. The hole size should be sufficient diameter to allow AirSweep to pass through wall.
3. Fasten plate to wall by bolting.
4. Apply anti-seize compound to front threaded section of AirSweep. Thread the AirSweep into position so the front of the body is aligned flush with the inside wall of vessel. This will properly position piston head within the vessel.
5. After the AirSweep is correctly positioned, tighten lock nut against plate to keep AirSweep in position.

VA-06-TRI-TRI and VA-12-TRI-TRI

AirSweep® Tri-Clamp Models Assembly and Mounting Options

VA-06-TRI-TRI

VA-12-TRI-TRI



Mounting Coupling for VA-06-TRI-TRI *(Weld to vessel)*

Mounting Coupling for VA-12-TRI-TRI *(Weld to vessel)*

Qty.	Description	VA-06-TRI-TRI	VA-12-TRI-TRI
1	Valve Body	VB-06-316-TRI-TRI	VB-12-316-TRI-TRI
*1	Valve Stem	VCW-06-316	VCW-12-316
*1	Spring Guide	SG-06-316	SG-12-316
*1	Compression Spring	CS-06-316	CS-1251-316
*1	Compression Washer	CW-06-316	CW-1251-316
*†	Elastic Stop Nut	(2) ESN-06-SS	(1) ESN-1251-SS
*†	Jam Nut	NA	(1) JN-1251-SS
1	Mounting Coupling	MC-06-316-TRI	MC-12-316-TRI
1	Lock Nut	LN-06-316	LN-12-316

** This part is included in the Rebuild Kit.*
† VA-06-TRI-TRI model includes two (2) Elastic Stop Nuts. Model VA-12-TRI-TRI include one (1) Elastic Stop Nut and one (1) Jam Nut.

TRI-TRI Model Rebuild Kit

AirSweep Nozzle Rebuild Kit contains 1 each:

- valve stem
- spring guide
- compression washer
- compression spring
- elastic stop nut
- jam nut

Rebuild Kits	
Model	**Rebuild Kit No.**
VA-06-TRI-TRI	RK-06-316
VA-12-TRI-TRI	RK-12-316

Recommended service interval of internal parts:
Approximately 1 million cycles.*

Maintenance recommended:
Replacement of internal parts.

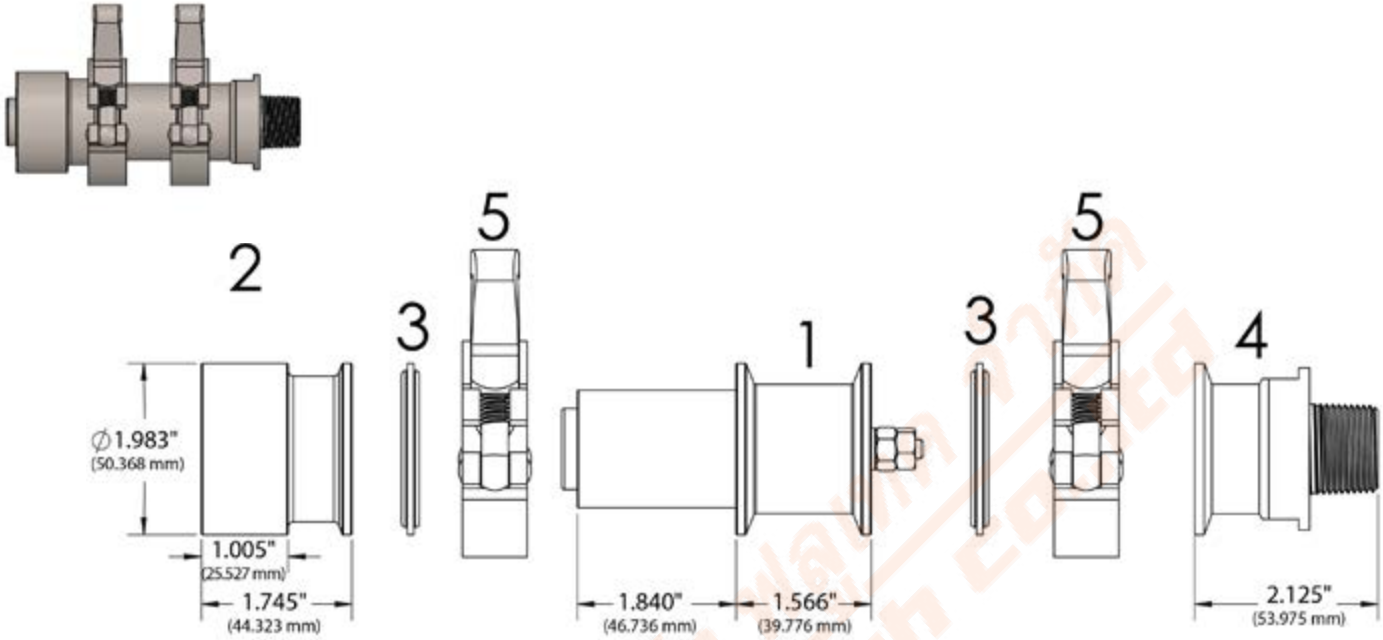
** Typical service interval under standard operating conditions. Some environments, materials and processes may result in a shorter useful service interval.*

VA-06-TRI-TRI and VA-12-TRI-TRI

AirSweep® Tri-Clamp Models Specification Drawings

VA-06-TRI-TRI

Specifications subject to change without notice.

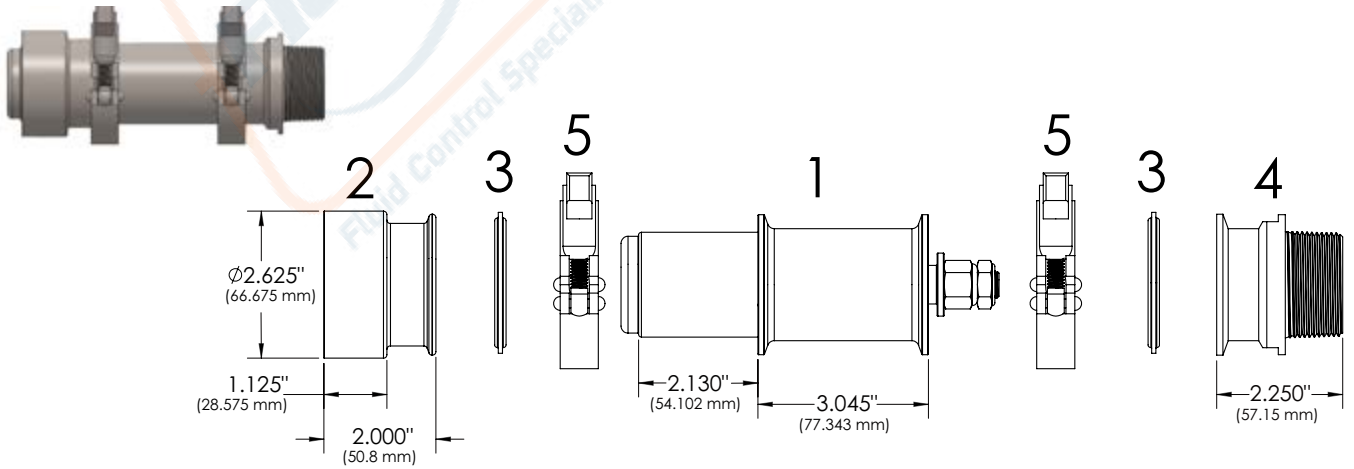


Item No.	Description	VA-06-TRI-TRI	VA-12-TRI-TRI
1	Tri-Clamp AirSweep Body	VA-06-316-TRI-TRI	VA-12-316-TRI-TRI
2	Mounting Coupling	MC-06-316-TRI	MC-12-316-TRI
3	Gasket	GASKET-06-TRI	GASKET-12-TRI
4	Adapter	AD-06-TRI	AD-12-TRI
5	Clamp	CLAMP-06-TRI	CLAMP-12-TRI

Note: *AirSweep Tri-Clamp Assemblies typically include the following parts, all sold separately:*

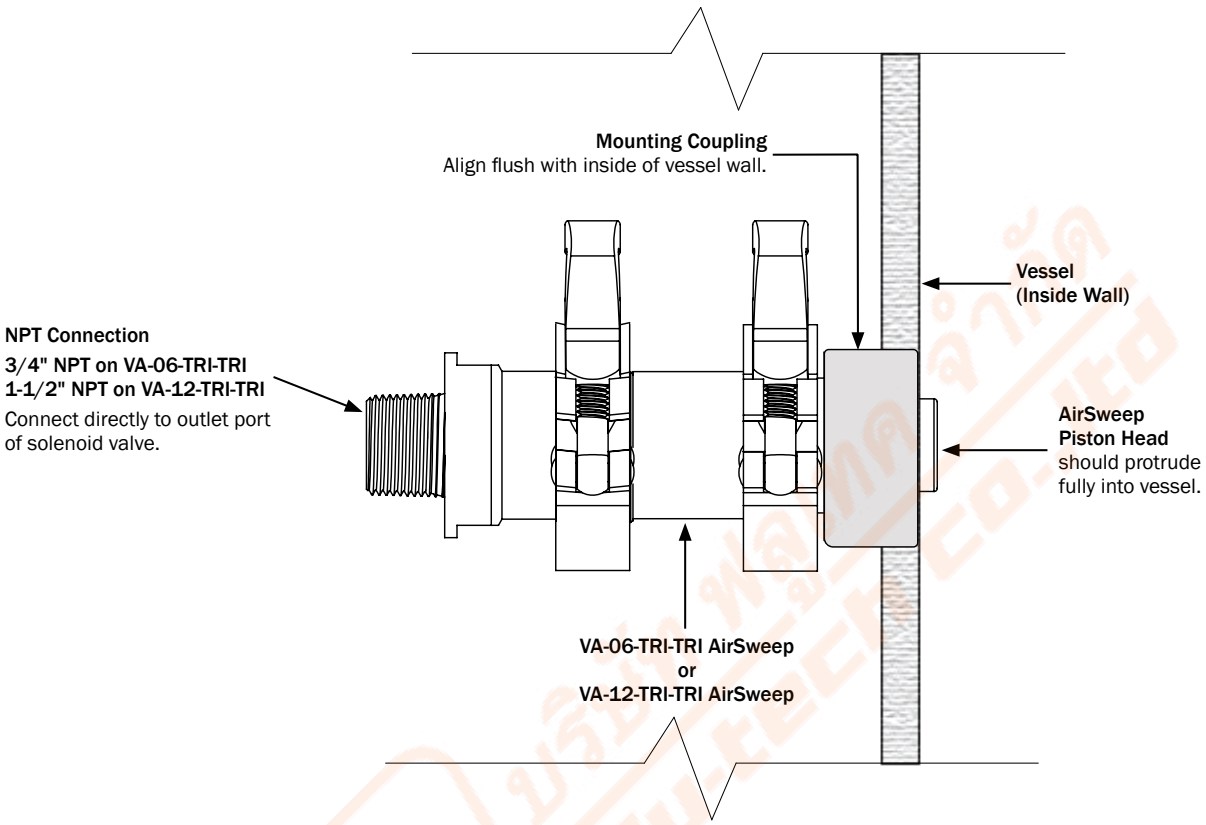
One (1) AirSweep Body
One (1) Mounting Coupling
Two (2) Clamps
Two (2) Gaskets
One (1) Adapter

VA-12-TRI-TRI



VA-06-TRI-TRI and VA-12-TRI-TRI

Mounting Installation



MC-06-TRI and MC-12-TRI Mounting Coupling Installation (Weld to vessel)

1. Cut hole in vessel wall. Recommended hole size of approximately 1/8" (3.175 mm) greater than diameter of coupling to allow coupling to pass through curved wall.
   For MC-06-TRI mounting coupling, recommended hole size is 2.108" (53.54 mm)
   For MC-12-TRI mounting coupling, recommended hole size is 2.75" (69.85 mm)
2. Align coupling flush with inside of vessel wall and weld continuous bead to exterior of wall.*
3. Install clamp gasket to inside groove in mounting coupling flange.
4. Push AirSweep fully into mounting coupling, ensuring clamp gasket is tightly sandwiched between AirSweep and mounting coupling.
5. Install tri-clover clamp around AirSweep and mounting coupling flange and finger-tighten until snug.
6. Apply Teflon tape to adapter thread and thread solenoid valve onto adapter. Do not over-tighten.
   Do not use pipe dope or paste on threads, as this material may foul the solenoid valve.
7. Install clamp gasket to inside groove in rear AirSweep flange.
8. Position adapter flange to mate with rear AirSweep flange – with gasket sandwiched between the two parts.
9. Install tri-clover clamp around rear flange and finger-tighten until snug.

Note: *On sharply curved vessel walls, front surface of mounting coupling may extend slightly into the vessel at top and bottom (12:00 & 6:00 positions), and should be flush at sides (3:00 & 9:00 positions).*

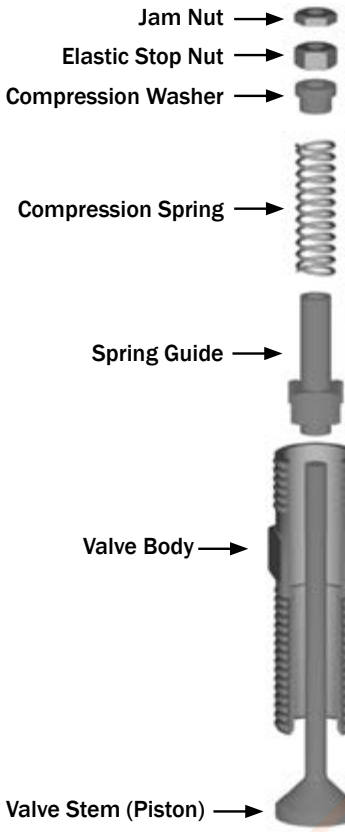
- For maximum effectiveness, connection between adapter and solenoid valve should be direct, with no additional pipe nipples or fittings. When possible, use only the supplied adapter. If additional pipe length is required, do not exceed 12" between solenoid valve and AirSweep.

*

Welding procedure must be done properly to avoid warping of Mounting Coupling Welding should be done in accordance with the A merican Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).

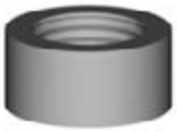
VA-06-ST, VA-12-ST, and VA-51-ST

AirSweep® Straight Shooter Models Assembly and Mounting Options



Lock Nut

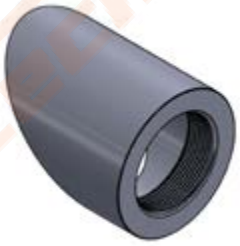
Mounting Options



Standard Mounting Coupling for all models *(Weld to vessel)*

Mounting Plate for VA-06 model *(Bolt to vessel)*

Mounting Flange *for VA-12 and VA-51 models (Bolt to vessel)*



45° Mounting Coupling for all models *(Weld to vessel)*

Standard materials of construction include:

- Carbon Steel
- 304 Stainless Steel
- 316 Stainless Steel

Other materials available upon request.

Straight Shooter Rebuild Kit

Straight Shooter Nozzle Rebuild Kit contains 1 each:

- valve stem
- spring guide
- compression washer
- compression spring
- elastic stop nut
- jam nut

Recommended service interval of internal parts:
Approximately 1 million cycles.*

Maintenance recommended:
Replacement of internal parts.

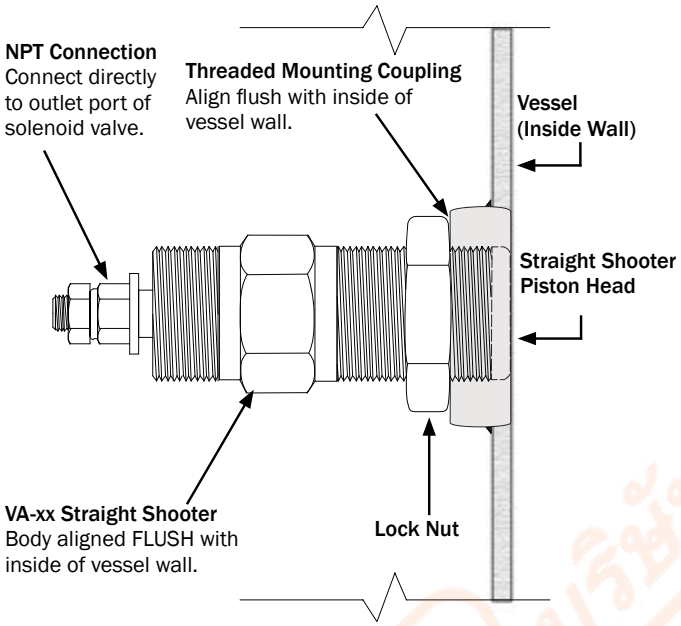
Straight Shooter Model No.	Material of Construction		
	Carbon Steel	304 Stainless Steel	316 Stainless Steel
VA-06-ST	RK-06-CS-ST	RK-06-SS-ST	RK-06-316-ST
VA-12-ST	RK-06-CS-ST	RK-12-SS-ST	RK-12-316-ST
VA-51-ST	RK-51-CS-ST	RK-51-SS-ST	RK-51-316-ST

* *Typical service interval under standard operating conditions. Some environments, materials and processes may result in a shorter useful service interval.*

VA-06-ST, VA-12-ST, and VA-51-ST
Mounting Installation

Standard Mount

Mounting Coupling Installation (Weld to vessel)



Straight Shooter Mounting Coupling Installation

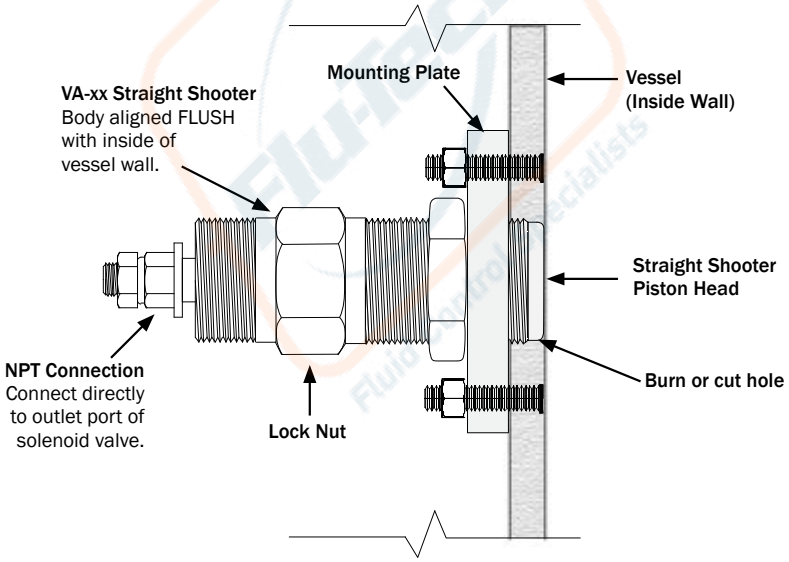
1. Cut hole in vessel wall. Recommended hole size is approximately 1/8" (3.175 mm) greater than diameter of coupling (see recommended hole size below), to allow coupling to pass through curved wall.

   Recommended hole size: VA-06-ST: 1-5/8" (41.275 mm)
   VA-12-ST: 3-1/8" (79.375 mm)
   VA-51-ST: 3-5/8" (92.075 mm)

2. Align coupling on vessel wall and weld continuous bead to exterior of wall.*
3. Apply anti-seize compound to front threaded section of Straight Shooter. Thread Straight Shooter into coupling until front of valve head is flush with inside wall.
4. After Straight Shooter is positioned, tighten lock nut against coupling to keep Straight Shooter in position.

* *Welding procedure must be done properly to avoid warping of Mounting Coupling.*
Welding should be done in accordance with the American Welding Society (AWS) standards as supported by ASME (American Society of Mechanical Engineers).

Mounting Plate Installation (Bolt to vessel)



Straight Shooter Mounting Plate Installation

1. Position plate on wall surface. Mark hole for Straight Shooter. Mark bolt circle layout.
2. Drill or cut hole for Straight Shooter and bolt holes. The hole size should be sufficient diameter to allow Straight Shooter to pass through wall.
3. Fasten plate to wall by bolting.
4. Apply anti-seize compound to front threaded section of the Straight Shooter. Thread the Straight Shooter into position so the front of the valve head is aligned flush with the inside wall of vessel. This will properly position piston head within the vessel.
5. After the Straight Shooter is correctly positioned, tighten lock nut against plate to keep the Straight Shooter in position.

AirSweep® Maintenance Requirements

Maintenance Requirements

Inspection of all components every 6 months is recommended for signs of wear or fatigue. Replacement of all internal parts is recommended after 1 million cycles. Failure to perform routine inspections and recommended replacement may result in sudden failure and possible contamination of material and/or damage to production equipment.

Isolation

Should it be necessary to overhaul any AirSweeps while the system is working, it will be necessary to first close the valve(s) isolating the AirSweep(s) on that part of the vessel. Next, switch on the AirSweep control system for one full cycle. This will allow compressed air to clear from all isolated pipes around the vessel, by cycling all AirSweeps within the system at least once.

CAUTION: To avoid injury, pressure must be relieved from header piping before maintenance is started.

Dismantling

1. Having first disconnected the electrical leads and the air piping, the AirSweep may be withdrawn by loosening hex setscrews or lock nut and removing AirSweep from mounting flange/plate or coupling.

   NOTE: Mark AirSweep body to insure proper re-alignment with interior wall.
2. At the work bench the solenoid valve should be unscrewed from the AirSweep.
3. Holding the front of the valve cap in a vise, loosen and remove the jam nut and elastic stop nut from the valve stem.

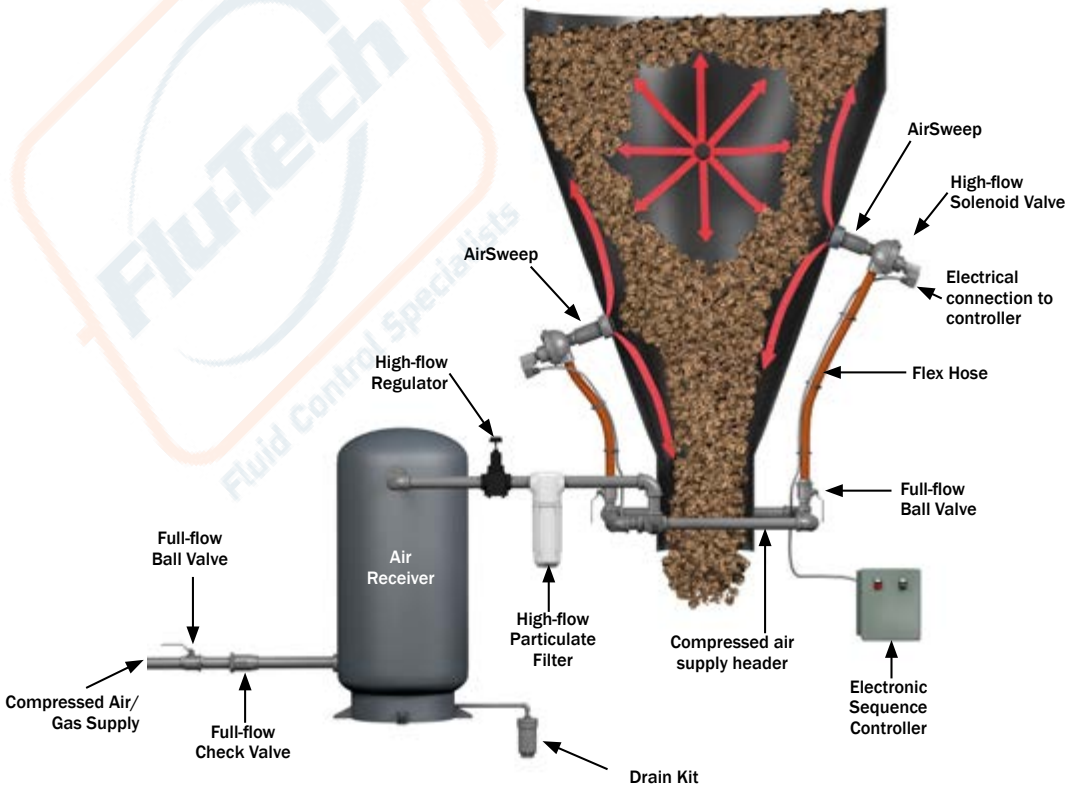
The compression washer, compression spring, spring guide and valve stem can then be taken out. Inspect all parts for signs of wear or fatigue. Particularly note threads of the valve stem and the front seat of the valve cap. Replace worn or damaged parts.

Reassembly

1. Reassemble valve assembly.
2. Tighten elastic stop nut to 3mm (1/8") of internal stop (front spring guide).
3. Check 1/8" dimension by manually pushing on rear of valve stem to extend (front) cap from body.
4. Reinstall jam nut, and tighten against elastic stop nut.
5. Reassemble with solenoid and place back in vessel.

IMPORTANT: Front of AirSweep valve body must align with interior of vessel wall.

AirSweep® System Components

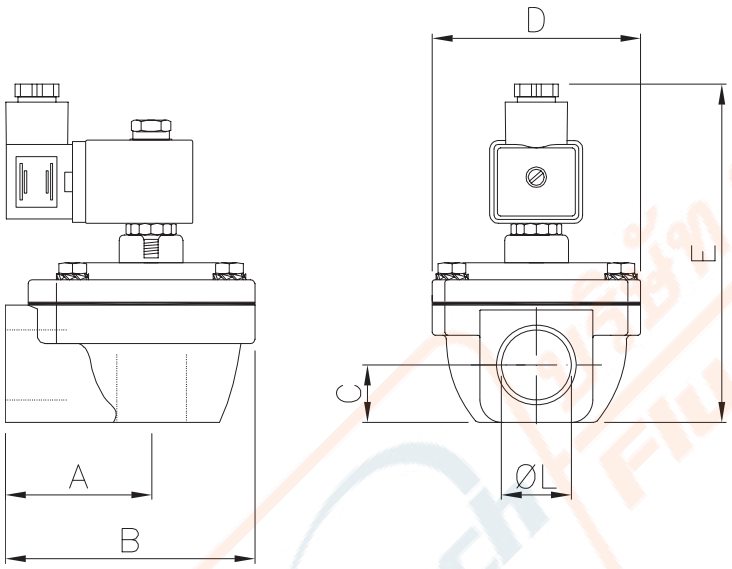


3/4" SOLENOID VALVE – MODEL SV-75

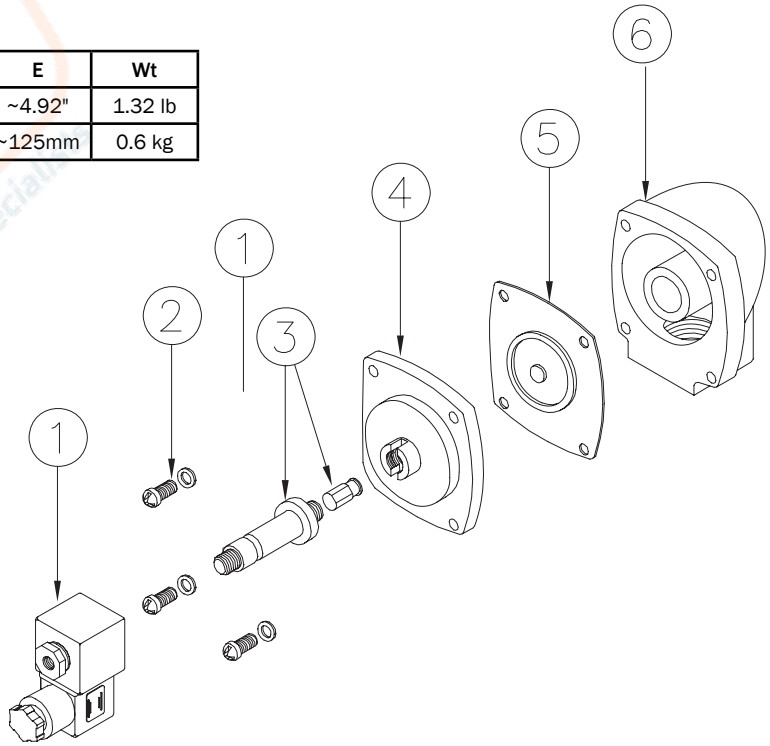
High-Flow Diaphragm Valve with Integral Solenoid

SV-75 Characteristics

Fluid	Filtered and oilfree compressed air
Temperature Range	STD diaphragm: -40°F to +176° F (-40°C to +80°C) Viton Diaphragm: -22°F to +392° F (-30°C to +200° C)
Operating Pressure	min. 7.25 psi; max. 108.78 psi (min. 0.5 bar; max. 7.5 bar)
Body & Cover	Die cast aluminum
Core Tube	Stainless Steel
Plunger	Stainless Steel
Screws	Stainless Steel
Coil Insulation	Class H
Connector	PG 9; IP65 DIN 43650 ISO 4400
Standard Voltage	230 - 110 - 24V / 50-60 VHz 19 VA 24 VDC 15W



Ø L (nom)	A	B	C	D	E	Wt
3/4"	2.05	3.54"	0.81"	2.91"	~4.92"	1.32 lb
19.05 mm	52 mm	90 mm	20.5 mm	74 mm	~125mm	0.6 kg



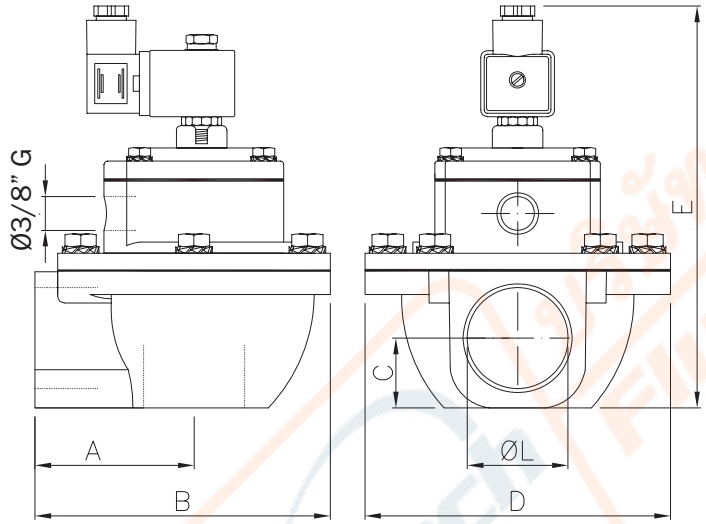
No.	Description	Component Part No.
1	Coil + Connector	BH10...V/50-60 Hz
2	Screws + Washer	VTE6x20 and VROS6
3	Pole Assembly	GPC 10
4	Cover	TCOP 25
5	Diaphragm	M25
6	Body	TCOR20FFG

1-1/2" SOLENOID VALVE – MODEL SV-150

High-Flow Diaphragm Valve with Integral Solenoid

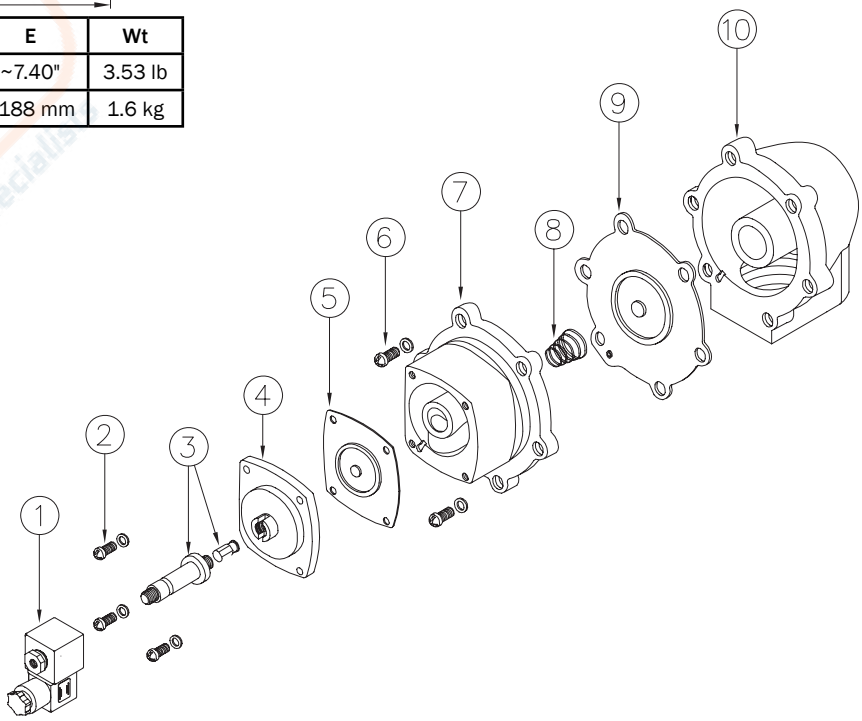
SV-150 Characteristics

Fluid	Filtered and oil-free compressed air
Temperature Range	STD diaphragm: -40°F to +176° F (-40°C to +80°C) Viton Diaphragm: -22°F to +392° F (-30°C to +200° C)
Operating Pressure	min. 7.25 psi; max. 108.78 psi (min. 0.5 bar; max. 7.5 bar)
Body & Cover	Die cast aluminum
Core Tube	Stainless Steel
Plunger	Stainless Steel
Screws	Stainless Steel
Coil Insulation	Class H
Connector	PG 9; IP65 DIN 43650 ISO 4400
Standard Voltage	230 - 110 - 24V / 50-60 VHz 19 VA 24 VDC 15W



Ø L (nom)	A	B	C	D	E	Wt
1-1/2"	2.81"	5.31"	1.22"	5.51"	~7.40"	3.53 lb
38.1 mm	71.3 mm	135 mm	31 mm	140 mm	~188 mm	1.6 kg

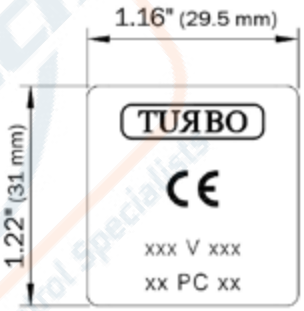
No.	Description	Component Part No.
1	Coil, Connector, Nut with gasket	BH10...V/50-60 Hz
2	Screws + Washers	VTE6x20 and VROS6
3	Pilot Unit	GPC 10
4	Pilot Cover	TCOP 25
5	Secondary Diaphragm	M25
6	Screws + Washers	VTE8x20 and VROS8
7	Main Cover	TCOP 40
8	Spring	TMOL 40
9	Main Diaphragm	M40
10	Valve Body	TCOR40FFG

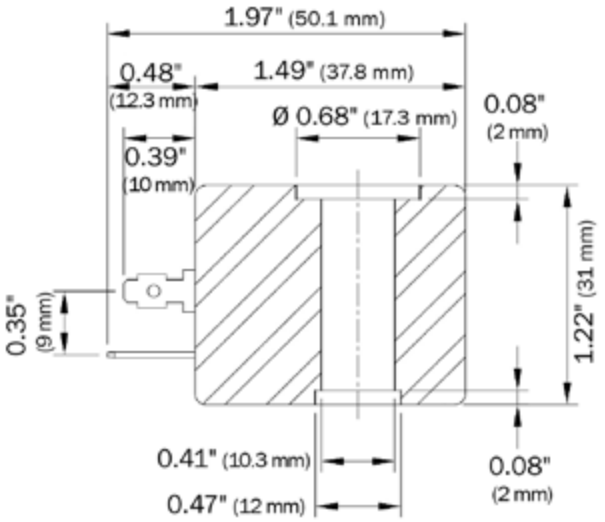


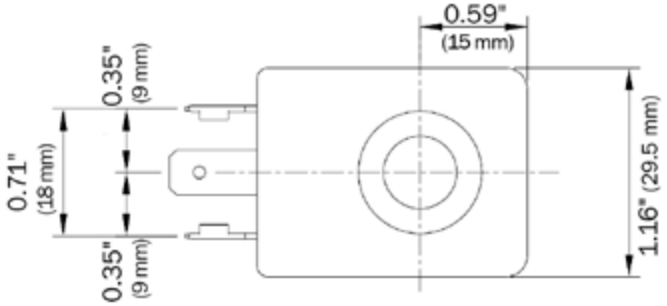
Solenoid Valve Coil for Models SV-75 and SV 150 Valves

The solenoid valve coil converts electrical energy into mechanical movement to control the opening and closing of the solenoid valve. While solenoid valves can be mounted in any position, mounting a valve vertically with the coil upwards is recommended.

Technical Features	
Nominal voltage	24 VAC 50-60VHz (±10%) 110 VAC 50-60VHz (±10%) 230 VAC 50-60VHz (±10%) 12 VDC (±10%) 24 VDC (±10%)
Power absorption at 68° F (20°C)	19VA AC working 18W DC working, standard version 18W DC working, standard version 12W DC working, low energy consumption type
Operating temperature	-4°F to +176°F (-20°C to +80°C)
Protection class	IP65 with DIN 43650 valve connector form A
Copper wire class	H maximum temperature 356°F / 180°C according to IEC 85
Isolation class	F (311°F / 155°C) Stnd H (356°F / 392°F [180°/200°C]) according to CEI EN 60034-1
Electric connections	3 x 0.248" (6.3mm) leads pins for fittings to DIN 43650 form A connector
Waterproof level	IP65 with DIN 43650 valve connector form A
Body overmolded	Nylon fiberglass reinforced
Available with ATEX Zone 21 and Zone 22	





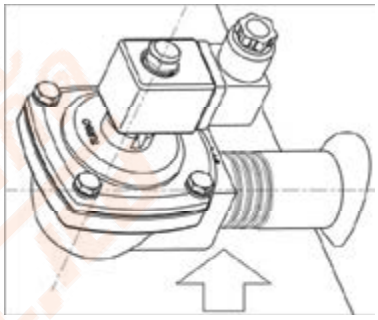


Installation – Models SV-75 and SV-150

WARNING: During installation, maintenance and replacement procedures, turn off the power supply before starting work.

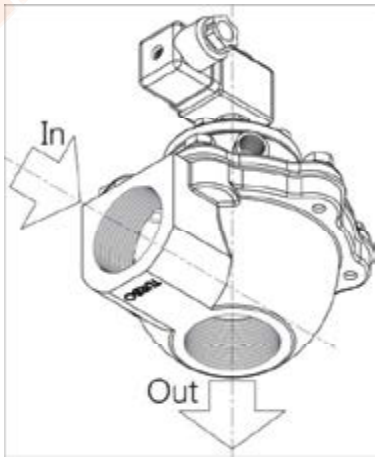
Ensure the tank is not pressurized. Tank should be completely empty.

Inform department personnel that power and pressure are turned off to avoid accidental start up.



Assembly and Installation:

- Screw the valve in place in its seat on the threaded stub. To avoid damages, do not overtighten the valve inlet connections.
- Spread a layer of gas-tight sealing paste for removable joints on the tank stub threads (not on the valve threads).
- Screw the valve onto the tank using the threaded connector marked **IN**, and secure it in place.



For proper operation:

- The power voltage must be ±10% of the rated value printed on the back of the solenoid coil.
- System compressed air pressure must be between 0.5 and7.5 Bar (7.25 to 116 psi).
- The diaphragm valve must be connected to systems that supply dry compressed air, with low solid particle residue, water and oil.
- The tank volume must be proportionate to the valve air consumption.

Maintenance – Models SV-75 and SV-150

Diaphragm Replacement

1. Unscrew the screws that secure the cover, remove it from its housing to access the diaphragm.
2. Remove the diaphragm.
3. Insert the new diaphragm, adhering it to the valve body perimeter.
4. The disk facing up and rivet with air passage hole in its housing.
5. Mount the diaphragm spring that must be housed on the disk centered on the rivet.
6. Replace the cover over the diaphragm, refer to the housing for the rivet with the air passage hole.
7. Screw in and tighten the screws with the following torque:

   M6: 7 Nm torque
   M8: 16 Nm torque
   M10: 32 Nm torque

Exploded view of SV-150

Pilot and Coil Replacement

1. Unscrew the nut at the top of the coil.
2. Unscrew the pilot unit from the valve cover.
3. Replace worn parts.
4. Reassemble the pilot unit guide sleeve, mobile core with gasket facing down, tighten with 6 Nm torque.
5. Insert the coil in the pilot unit and tighten the nut with 8 Nm torque.

Troubleshooting

The valve does not work:

- No coil power.
- The power supply is insufficient or out of tolerance, it must be ±10% of the rated value.
- Tank air pressure insufficient.
- Pilot unit blocked, impurities prevent movement.

The valve does not close:

- The electric signal is always on and keeps the coil energized.
- Pilot unit blocked, impurities prevent movement.
- Tank air pressure too high.
- Damaged diaphragm.
- Damaged diaphragm spring.
- Loose cover fastening screws.

Before pressurizing the circuit, start the valve several times to check correct operations.

SOLENOID VALVE – MODEL DV1251

1-1/2" PULSE VALVE with INTEGRAL SOLENOID PILOT

DESCRIPTION:

The DV1251 Series valve is a 2-way quick opening/closing, high flow, diaphragm-type integral solenoid piloted valve. Also available as a remote pilot-operated valve (RDV1251).

SOLENOID ENCLOSURES:

- **DV1251-C or D:** Watertight, NEMA Types 1, 2, 3/3S, 4/4X
- **DV1251-XP:** Explosion-Proof and Watertight, NEMA Types 3/3S, 4/4X, 6/6P, 7, 9

Type 7: Explosion-Proof Class 1, Division 1, Groups A, B, C & D
Type 9: Dust ignition-proof, Class II, Division 1, Groups E, F & G

ELECTRICAL (110/120 or 220/240 AC volts, 50/60 Hz)*

Watts: 10.1
VA Holding: 25
VA Inrush: 50
**Other AC & DC voltages available.*

CONSTRUCTION (Parts in contact with fluids)

Body: Aluminum (less than 0.4% copper)
Seals: Buna-N
Discs: Buna-N
Diaphragm: Hytrel**
*** Viton seals and diaphragm available for high heat applications.*

NOMINAL TEMPERATURE RANGES***

Ambient & Fluids: 0°F to 150°F
(-19°C to 66°C)
****For high temperature, specify Viton diaphragm & seals.*

Viton range: 0°F to 350°F
(-18°C to 177°C)

Fluid: Air or Nitrogen (inert gas)

Working Pressures: Minimum 5 psi
Maximum 125 psi

Cv flow factor: 53

Pipe size: 1-1/2" NPT inlet & outlet, and 3/8" NPT exhaust port.

SOLENOID VALVE – MODEL DV1251 *(continued)*

1-1/2" PULSE VALVE with INTEGRAL SOLENOID PILOT

OPERATION

Valve is Normally Closed when solenoid is de-energized. Valve opens when solenoid is energized.

INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

For DV1251-XP ONLY

Caution: To prevent fire or explosion, do not install the DV1251-XP where ignition temperature of hazardous atmosphere is less than 165°C (329°F).

POSITIONING

This valve is designed to perform properly when mounted in any position.

NOTE: *For optimum life and performance, the solenoid should be mounted vertical and upright to reduce the possibility of foreign matter accumulating in the core tube area.*

PIPING

Connect piping to valve according to markings on valve body (Inlet port is marked with "IN"). **3/8" port on upper chamber of valve is exhaust ONLY**. Do not connect anything to exhaust port except a high-flow muffler or strainer. Restriction to flow through this port will cause valve to malfunction, operate sluggishly or not operate at all.

Thread seal tape is recommended, rather than pipe compound. If compound is used, apply sparingly to male threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening pipe, do not use valve as a lever. Wrenches applied to valve body or piping should be located as close as possible to connection point.

CAUTION:
To avoid damage to the valve body DO NOT OVER-TIGHTEN PIPE CONNECTIONS.
If tape thread seal, spray or similar lubricant is used, use extra care due to reduced friction.

WIRING

Wiring must comply with Local and National Electrical Codes. Conduit-style solenoid housings are provided with a hole to accommodate 1/2" NPT conduit. The solenoid enclosure may be rotated to facilitate wiring.

SOLENOID TEMPERATURE

Standard DV1251 valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched by the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odor of burning coil insulation.

FOR DV1251-XP ONLY:

The integral solenoid in the DV1251-XP has an internal non-resettable thermal fuse to limit solenoid temperature in the event that extraordinary conditions occur which could cause excessive temperatures. These conditions could include high input voltage, a jammed core, excessive ambient temperature, or a shorted solenoid, etc.

SOLENOID VALVE – MODEL DV1251 *(continued)*

1-1/2" PULSE VALVE with INTEGRAL SOLENOID PILOT

VALVE DISASSEMBLY (Refer to diagram on page 29)

De-pressurize valve and turn off electrical power supply. If rigid conduit is used it may be necessary to disconnect it. Proceed in the following manner:

1. Disassemble valve in an orderly fashion, paying careful attention to exploded view provided for identification of parts.
2. Remove retaining clip & plate and slip the entire coil enclosure off the solenoid base subassembly.
3. Unscrew solenoid base sub-assembly from pilot bonnet. Remove core assembly, core spring, core guide and solenoid base gasket.
4. Unscrew pilot bonnet screws and remove pilot bonnet and pilot diaphragm assembly.
5. Remove main bonnet screws, main valve bonnet and main diaphragm assembly.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete spare parts kit for best results.

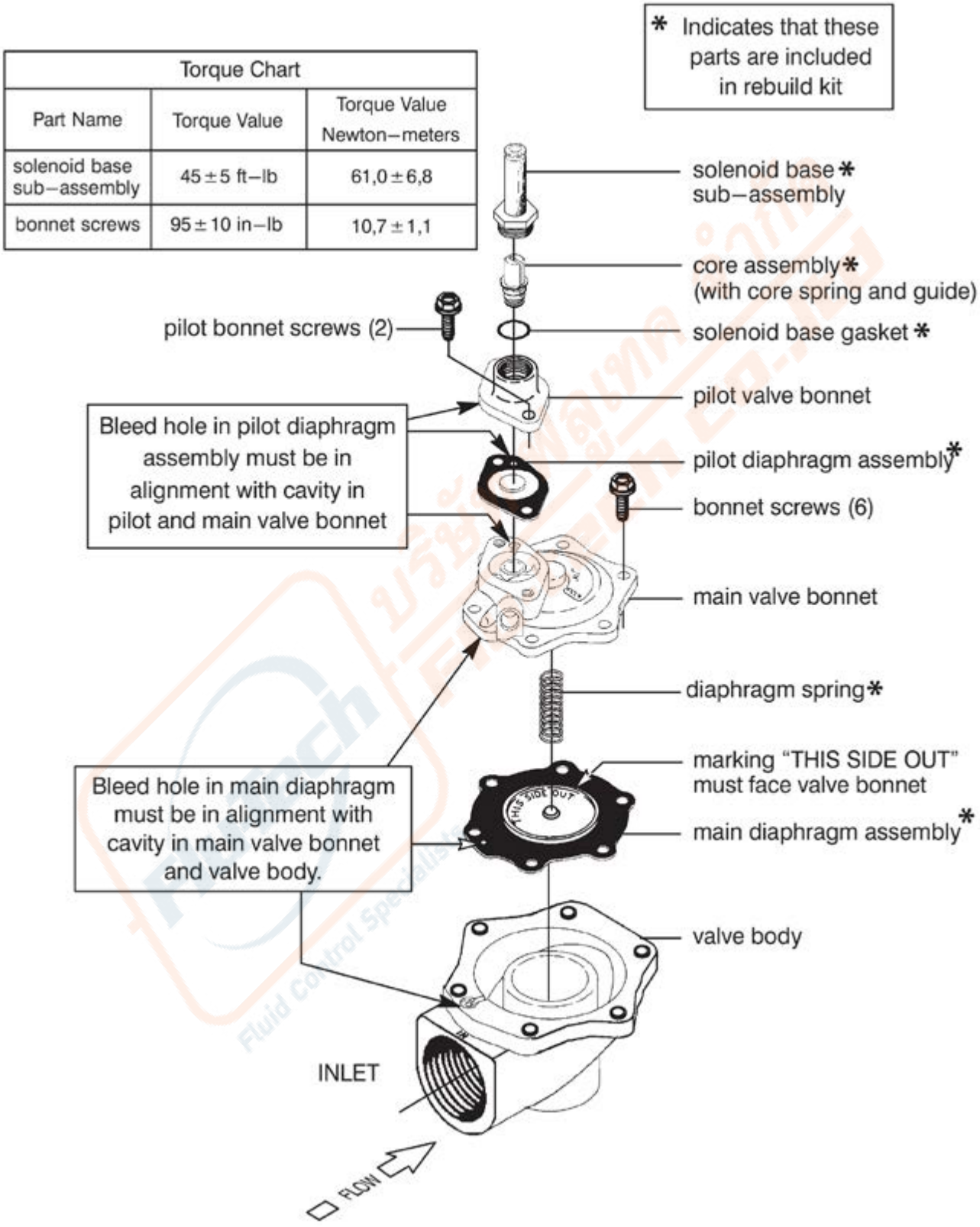
VALVE REASSEMBLY

1. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
2. Lubricate solenoid base gasket with DOW CORNING 111 Compound lubricant or an equivalent high-grade silicone grease.
3. Replace main diaphragm assembly with marking "THIS SIDE OUT" facing main valve bonnet. Be sure that bleed hole in diaphragm assembly is in alignment with cavity in valve body and bonnet. The external contours of the diaphragm assembly, body and bonnet must all be in alignment.
4. Replace main bonnet and bonnet screws. Torque main bonnet screws in a crisscross manner to 160 ± 10 inch-pounds (18,1 ± 1,1 Newton meters).
5. Position pilot diaphragm assembly in valve bonnet. Be sure bleed hole in pilot diaphragm assembly is in alignment with cavity in bonnet.
6. Replace pilot bonnet and pilot bonnet screws. Torque pilot bonnet screws evenly to 95 ± I0 inch-pounds (10,7 ± 1,1 Newton meters).
7. Position core assembly with core spring and core guide into solenoid base sub-assembly. Engage this assembly into the pilot bonnet. Torque solenoid base sub-assembly to 175 ± 25 inch-pounds (19,8 ± 2,8 Newton meters).
8. Replace coil and retaining clip.

SOLENOID VALVE – MODEL DV1251 *(continued)*

1-1/2" PULSE VALVE with INTEGRAL SOLENOID PILOT

Torque Chart		
Part Name	Torque Value	Torque Value Newton–meters
solenoid base sub–assembly	45 ± 5 ft–lb	61,0 ± 6,8
bonnet screws	95 ± 10 in–lb	10,7 ± 1,1



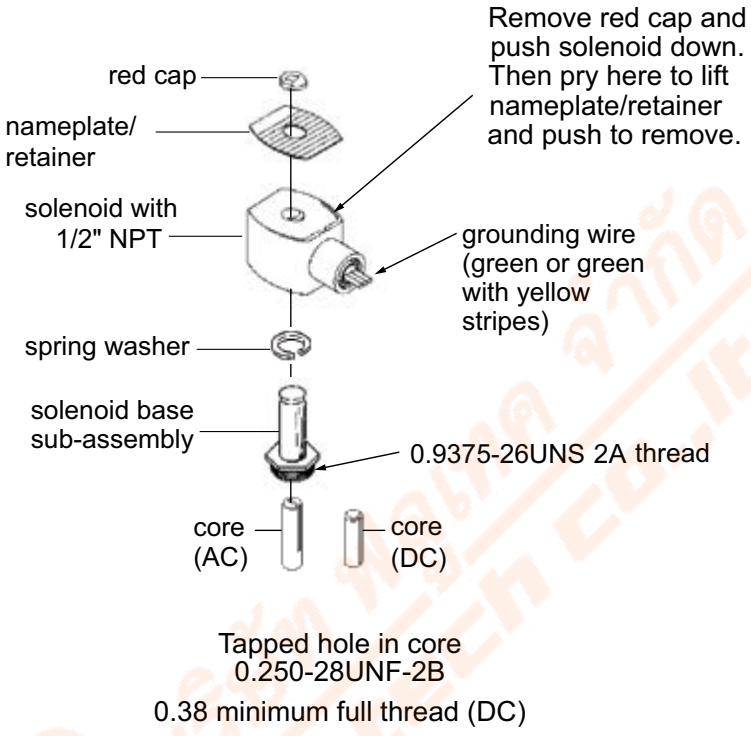
Parts marked with (*) are supplied in Spare Parts Kit # RK-DV1251.

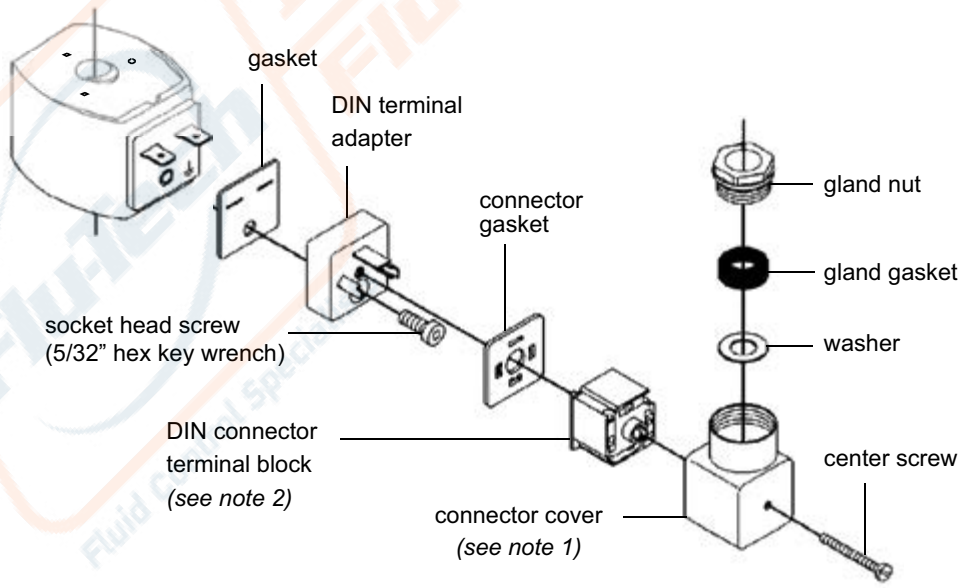
SOLENOID VALVE – MODEL DV1251 *(continued)*

Coil Connection Options

Note: DIN Connector not available on XP valves.

DV1251-C & DV1251-XP
(Conduit Connection)



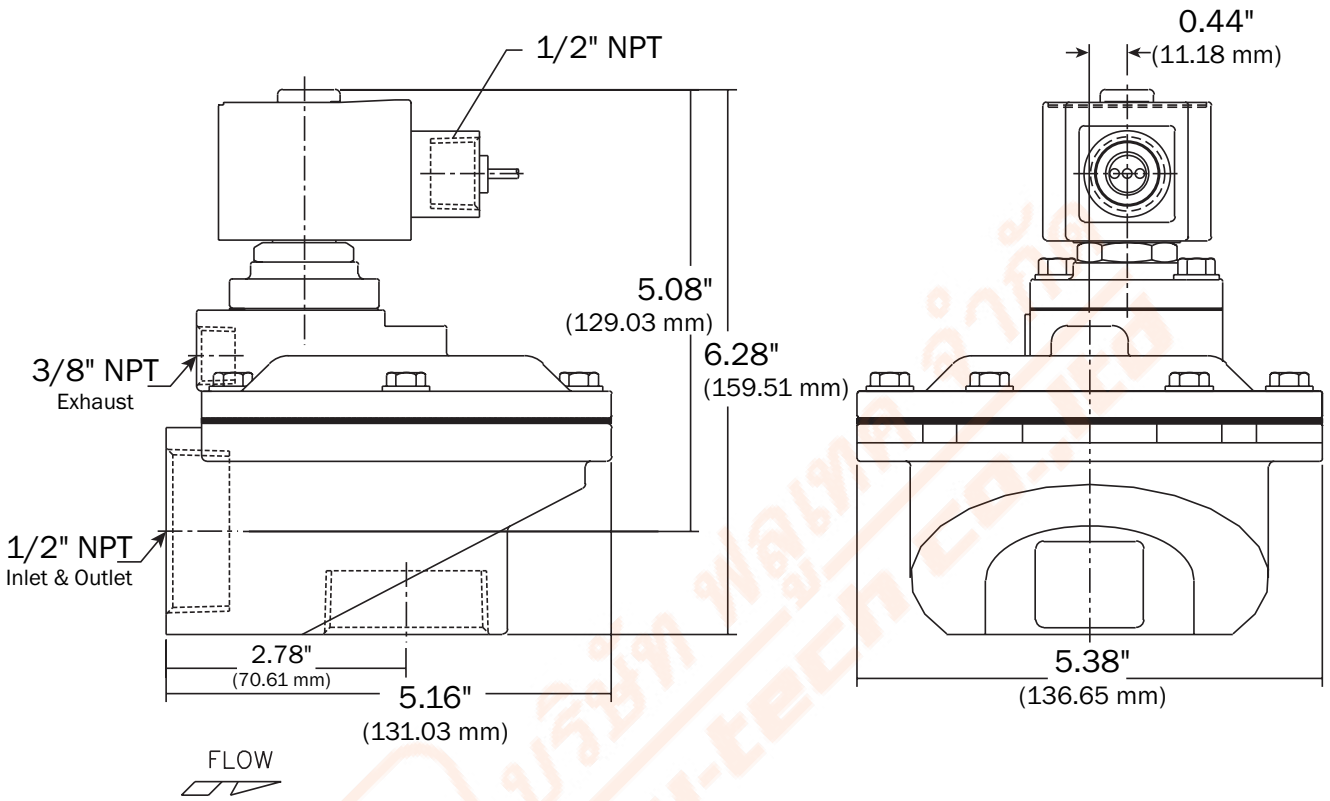


Notes:

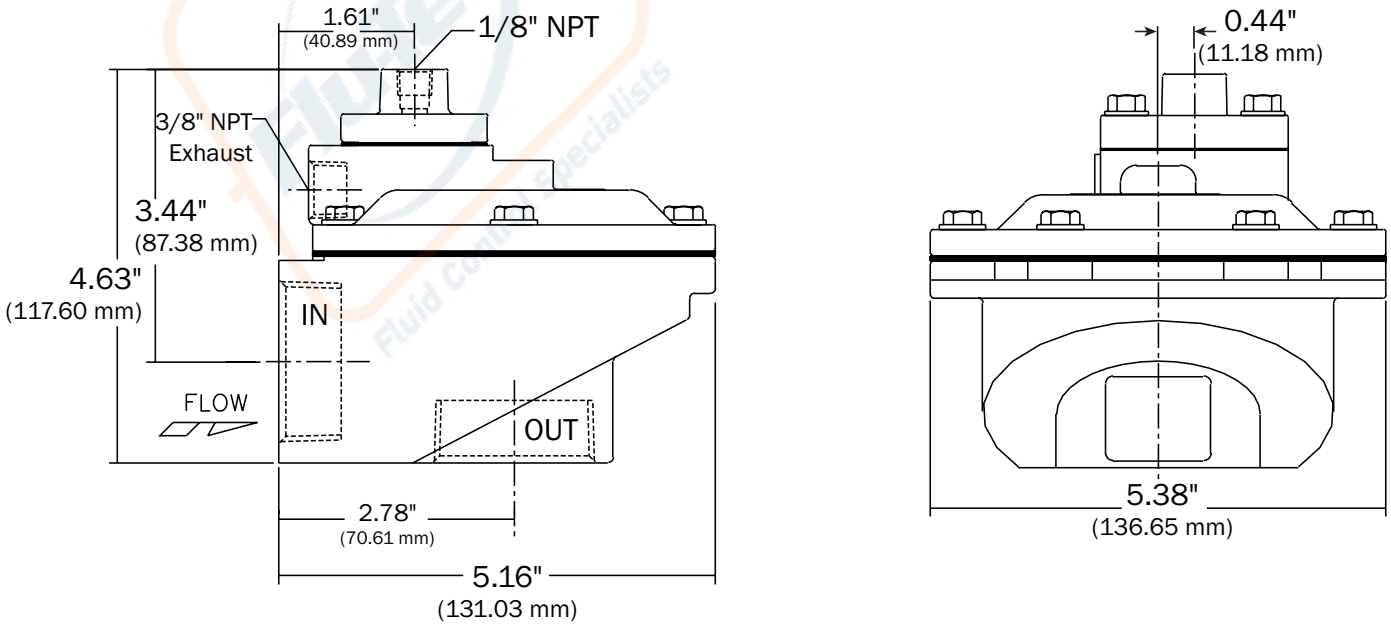
1. Connector cover may be rotated in 90-degree increments from position shown for alternate position of cable entry.
2. Refer to markings on DIN connector for proper electrical connections.

SOLENOID VALVE – MODEL DV1251 *(continued)*

DV1251 Diaphragm Valve with Integrated Solenoid – 1-1/2"



RDV1251 Remote Pilot-operated Diaphragm Valve – 1-1/2"



Maintenance

Warning:
Turn off electrical power supply and de-pressurize valve and header before making repairs.

NOTE: It is generally not necessary to remove the valve from the pipeline for repairs.

CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary depending on medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required.

PREVENTIVE MAINTENANCE

1. Keep medium flowing through valve as free from dirt and foreign material as possible.
2. While in service, operate valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on medium and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts, seats and bleed holes. Replace any parts that are worn or damaged.

IMPROPER OPERATION

1. **Faulty Control Circuits:** Check the electrical system by energizing the solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires, terminals or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil; if faulty, replace coil.
3. **Low Voltage:** Check voltage across coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within 5 - 125 psi.
5. **Excessive Leakage or Failure to Open or Close:** Check for restrictions to or blockage of exhaust port. Disassemble valve and clean all parts. Check for clogged bleed holes or torn diaphragm assemblies. Replace parts that are worn or damaged with a complete spare parts kit for best results

SOLENOID VALVE – MODEL DV06

3/4" PULSE VALVE with INTEGRAL SOLENOID PILOT

DESCRIPTION:

The DV06-series valve is a 2-way quick opening/closing, high flow, piston diaphragm-type integral solenoid piloted valve. Also available as a remote pilot-operated valve (RDV06).

SOLENOID ENCLOSURES:

- **DV06-C, DV06-D:** Watertight, NEMA Types 1, 2, 3/3S, 4/4X
- **DV06-XP:** Explosion-Proof and Watertight, NEMA Types 3/3S, 4/4X, 6/6P, 7, 9

Type 7: Explosion-Proof Class 1, Division 1, Groups A, B, C & D
Type 9: Dust ignition-proof, Class II, Division 1, Groups E, F & G

ELECTRICAL (110/120 or 220/240 AC volts, 50/60 Hz)*

Watts: 10.1
VA Holding: 25
VA Inrush: 50
**Other AC & DC voltages available.*

CONSTRUCTION (Parts in contact with fluids)

Body: Aluminum (less than 0.4% copper)
Seals: Buna-N
Discs: Buna-N
Diaphragm: Hytrel

NOMINAL TEMPERATURE RANGES***

Ambient & Fluids: 0°F to 150°F (-19°C to 66°C)

Fluid: Air or Nitrogen (inert gas)

Working Pressures: Minimum 5 psi
Maximum 125 psi

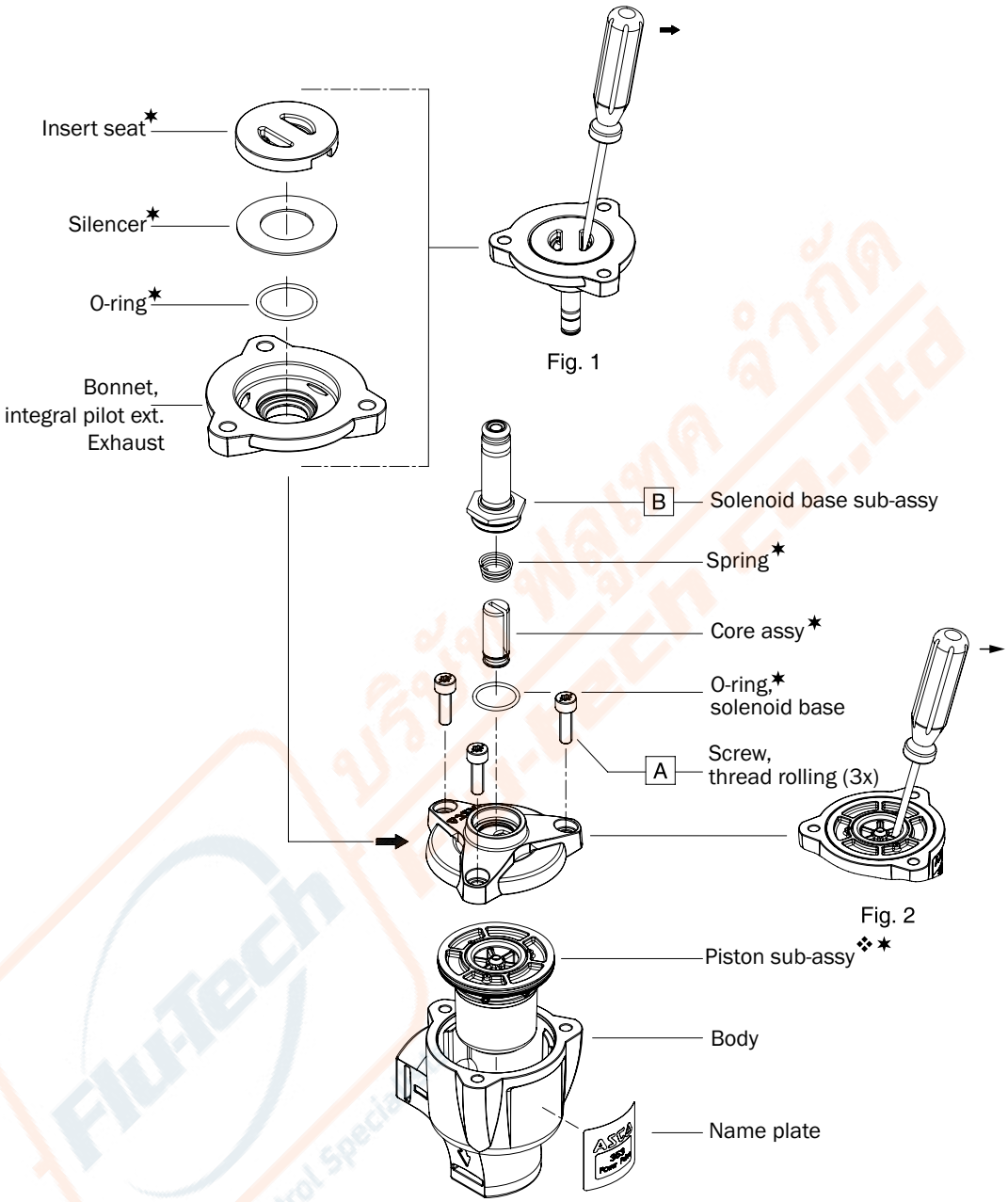
Cv flow factor: 15

Pipe size: 3/4" NPT inlet & outlet.

Total Assembly Weight: 1.5 lb

SOLENOID VALVE – MODEL DV06

Exploded View – Without Coil



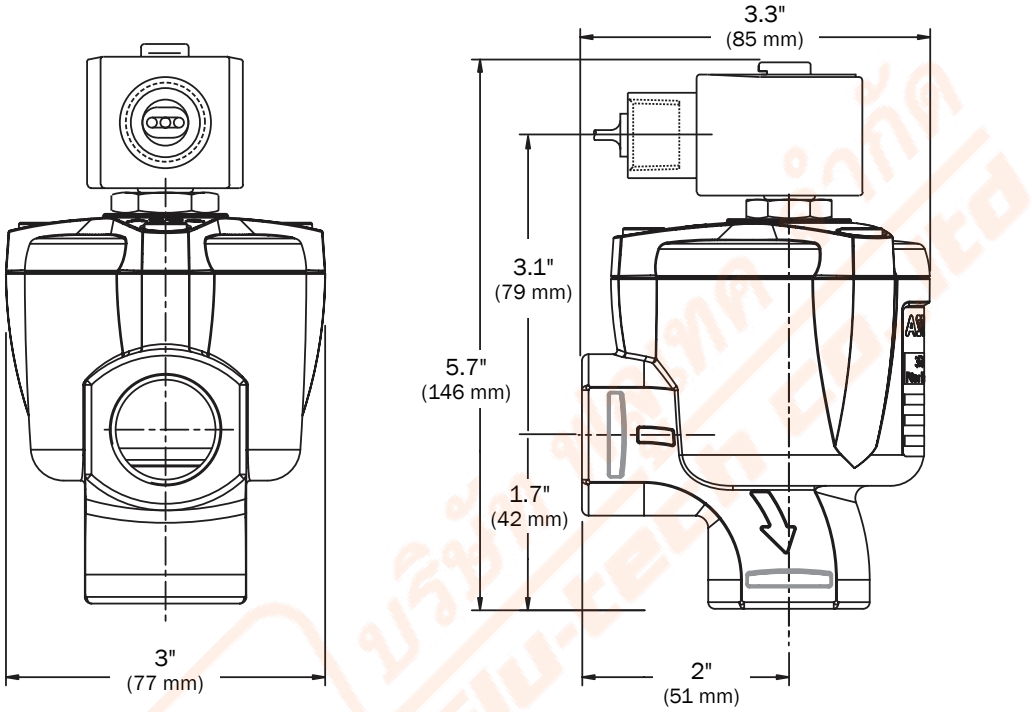
Torque screws to 62 ± 9 in-lbs. (7 ± 1 Nm)

Parts marked (★) Included in Spare Parts Kit # RK-DV06-08

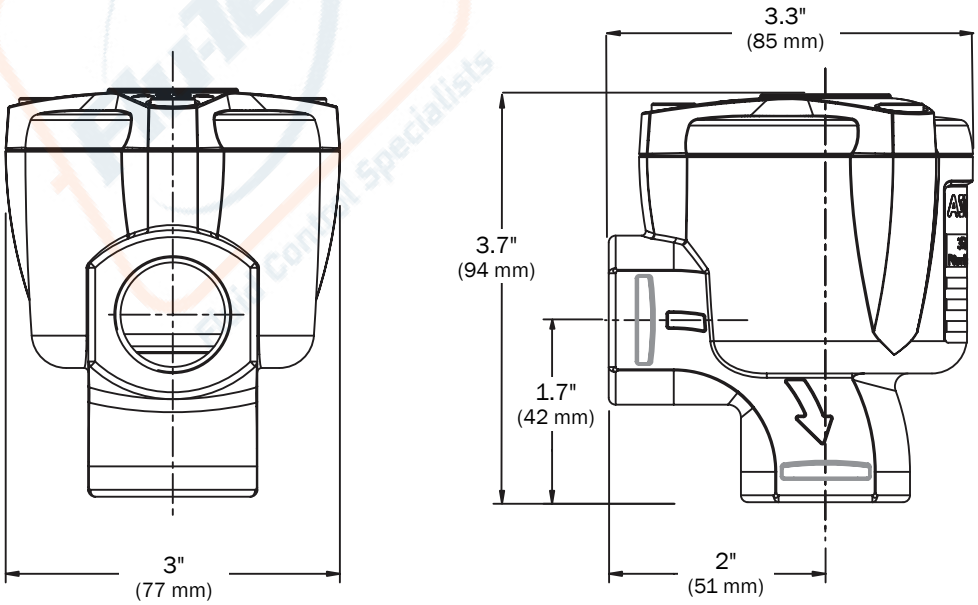
Piston sub-assembly available individually (Part Number: C117-271)

SOLENOID VALVE – MODEL DV06 *(continued)*

DV06 Diaphragm Valve with Integral Solenoid – 3/4"



RDV06 Remote Pilot-operated Diaphragm Valve – 3/4"

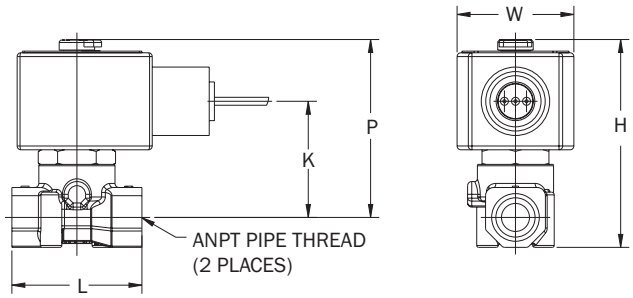


8262 SERIES PILOT VALVES FOR REMOTE PILOT-OPERATED DIAPHRAGM VALVES

Part No. 8262H007

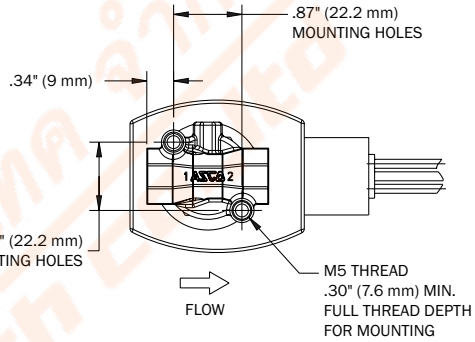
2-way, normally closed, pilot valve
Stainless steel construction
Available in AC/DC voltages
NEMA 4 or NEMA 7 options available *(NEMA 4 pictured)*

Pipe Size: 1/4"
Cv flow factor: 0.35
Max. Operating Pressure Differential (Air, Inert Gas)/DC@104°F: 130 psi



H	K	L	P	W
2.96" (75 mm)	1.72" (44 mm)	1.56" (40 mm)	2.60" (66 mm)	1.63" (43 mm)

Mounting Dimensions

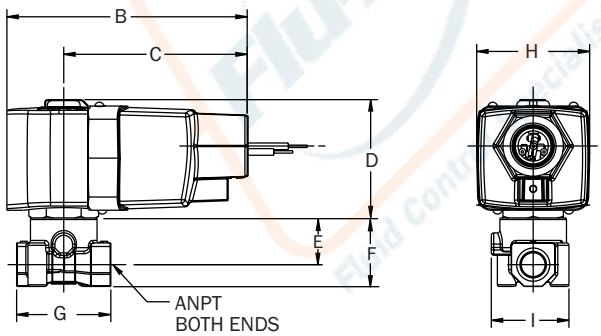


Note: Mounting holes will accept a standard #10-32 machine screw.

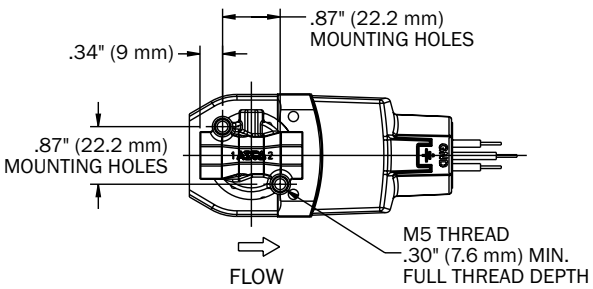
Part No. 8262230 24-120

Normally-closed solenoid operated pilot valve, 1/4" in/out,
stainless steel construction,
24-120 VAC, 24-125 VDC
Available in NEMA 4/NEMA 7 *(NEMA 4 pictured)*

Pipe Size: 1/4"
Cv flow factor: 0.88
Max. Operating Pressure Differential (Air, Inert Gas): 105 psi



Mounting Dimensions



B	C	D	E	F	G	H	I
3.98" (101 mm)	3.04" (77mm)	2.00" (51 mm)	0.78" (20 mm)	1.11" (29 mm)	1.56" (40 mm)	1.87" (48 mm)	1.29" (33 mm)

MODEL MCA45T 1-1/2" NPT DIAPHRAGM VALVE

High performance diaphragm valve with threaded ports. Outlet at 90° to inlet.

Pilot Connections: 1/8" NPT
Exhaust Connections: 3/8" NPT

Nominal Valve Size: 1.77" (45 mm)
Nominal Port Size: 1.5" (40 mm)
Number of Diaphragms: 2
Flow: 51 CV, 44 KV
Weight: 3.3 lb (1.5 kg)

Pressure Range: 5-125 psi (30-860 kPa)
Temperature Range:
Nitrile Seals: -40°F to 179.6°F
(-40°C to 82°C)
Viton Seals: -20.2°F to 449.6°F
(-29°C to 232°C)

Installation

1. Prepare supply and blowtube pipes to suit valve specification. Avoid installing valves underneath the tank.
2. Ensure tank and pipes are free from dirt, rust or other particulate.
3. Ensure supply air is clean and dry.
4. Mount valves to inlet pipes and blowtube to valves, ensuring no excess thread sealant can enter the valve itself.
5. Make electrical connections to solenoid.
6. Apply moderate pressure to system and check for installation leaks.
7. Fully pressurize system.
8. Test fire and listen for proper actuation and crisp pulse noise.

Operation

Recommended on-time range: 50–500 ms
Recommended time between pulses: 1 minute or greater

Construction

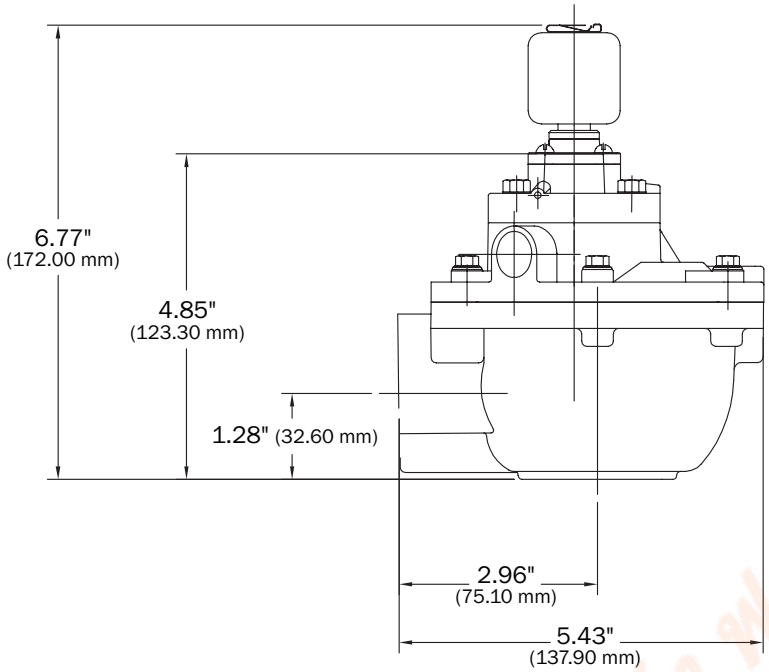
Body: Aluminum (diecast)
Ferrule: 305 SS
Armature: 430FR SS
Seals: Nitrile or Viton
Spring: 304 SS
Screws: 302 or 304 SS
Diaphragm Seat: PA-66 (standard), Viton or Nitrile coated mild steels, Nitrile, Viton or High Density PE

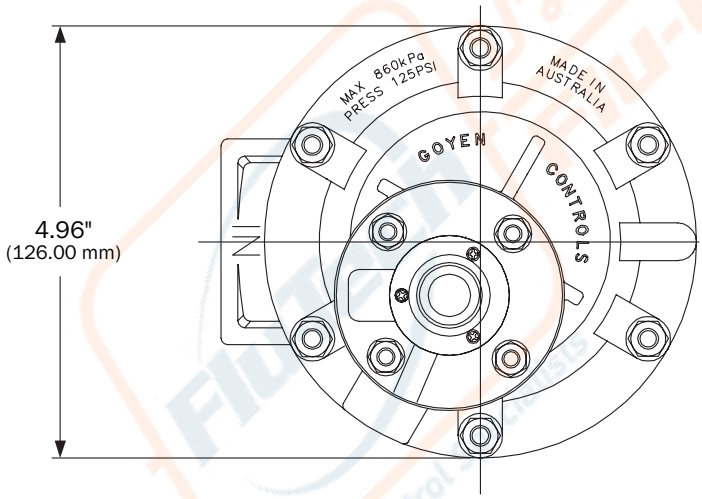
Maintenance

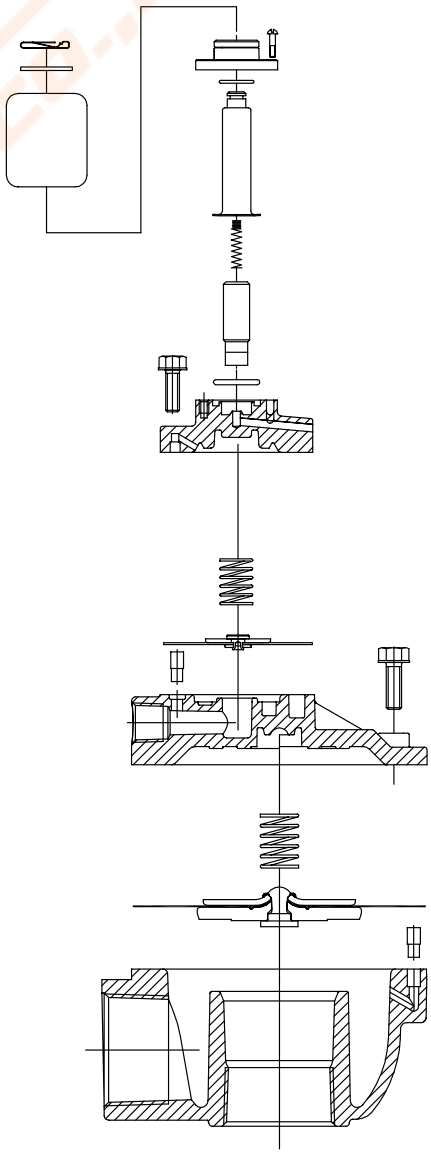
Before conducting any maintenance activity on the system ensure that components are fully isolated from pressure and power supplies. Pressure and power should not be reapplied until the valve has been fully assembled.

Diaphragm and pilot inspection should be conducted annually.

MODEL MCA45T 1-1/2" NPT DIAPHRAGM VALVE



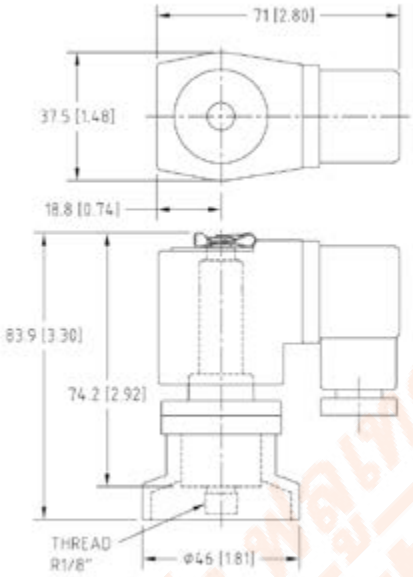




Spare Parts Kit				
	Solenoid Kit		Diaphragm Kit	
MODEL	Buna N	Viton	Buna N	Viton
MCA45T	K0380	K0384	RK-45	K4503

RCA3DM
Pilot Valve Coil Kit

Dimensions in mm and (inches)



FOR INTEGRAL PILOT (CA) APPLICATIONS

The RCA3DM is a pilot valve with an integral silencer and dust shroud which mounts directly (screw in) to the 4-series valve cover.

RCA3DM and RCA3PV are suitable piloting options for all 4-Series valves and RCA35T diaphragm valve.

COIL CONSTRUCTION

Encapsulation: PA-66
C-Frame: Mild steel, zinc passivated
Bobbin: PA-66
Insulation Class: B/130°C
IP Rating: IP65
Rating: Non-continuous use only
Clip: Mild steel (mechanically plated)

OPERATION

Recommended on time range: 50 to 500 ms
Recommended time between pulses: 1 minute or greater

COIL CERTIFICATION AND CONFORMITIES

- C-Tick
- EMC (89/336/CE)
- CE – EMC (2004/108/EC) and LV (2006/95/EC)
- CSA

SPARE PARTS

K0380 – Kit includes Nitrile replacement seal, armature, spring and ferrule.

K0384 – Kit includes Viton replacement seal, armature, spring and ferrule.

RCAC20ST4
High-Flow Diaphragm Valve

CONSTRUCTION

Body: Aluminium (diecast)

Screws: 304 Stainless steel

Diaphragm: Proprietary high-performance engineering/ thermoplastic Elastomer or Viton

OPERATION

Recommended on time range: 50 to 500 ms

Recommended time between pulses: 1 minute or greater

MAINTENANCE

Before conducting any maintenance activity on the system ensure that components are fully isolated from pressure and power supplies. Pressure and power should not be reapplied until the valve has been fully assembled.

Diaphragm and pilot unit inspection should be conducted annually.

APPROVALS

The RCAC20ST4 meet the requirements of the European Low Voltage Directive 2006/95/EC, when fitted with the RCA3PV pilot.

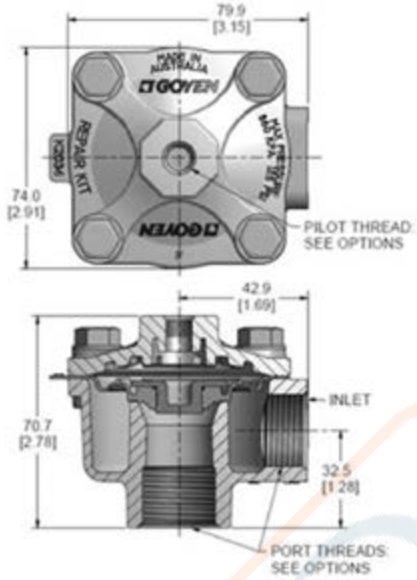
DESCRIPTION

High-performance diaphragm valve with short threaded ports. Equipped with 'Shockwave' springless diaphragm. The 4 series valves are available as remote pilot valves and may be converted to an integral pilot using either the RCA3DM or RCA3PV screw-in pilots. Outlet is at 90° to inlet.

SUITABLE FOR

Dust collector applications, in particular for reverse pulse jet filter cleaning and its variations, including bag filters, cartridge filters and envelope filters, ceramic filters and sintered metal fiber filters.

Dimensions in mm and (inches)



Please Note: *We recommend using Schedule 40 pipe. Thickness OD is as shown below.*

SIZE	OD
3/4"	26.67 mm / 1.05"

WEIGHTS	
Valve	**kg (lb)**
RCAC20ST4	0.30 (0.66)

MAINTENANCE KITS		
Model	**Shockwave**	**Viton**
Diaphragm Kit RCAC20ST4	K2034	K2033

PRODUCT CHARACTERISTICS AND PERFORMANCE					
Nominal Port Size	**Number of Diaphragms**	**Flow**	**Pressure Range**	**Temperature Range**	
				Shockwave	**Viton**
20 mm (3/4")	1	14 KV (17 CV)	30 kPa (5 psi) to 860 kPa (125 psi)	-40° C (-40°F) to 82° C (176.6°F)	-29°C (-20.2°F) to 232°C (449.6°F)

VXM-208 and VXM-212 Stainless Steel Diaphragm Valves

The 200 SERIES in stainless steel is a range of diaphragm valves suitable for dust collector applications. The 200 Series valve has the inlet port at 90° to the outlet port. The range includes two models, which comprises a 1" valve and a 1-1/2" size valve. Both models have a single diaphragm. The inlet and outlet ports have threaded female gas connections.

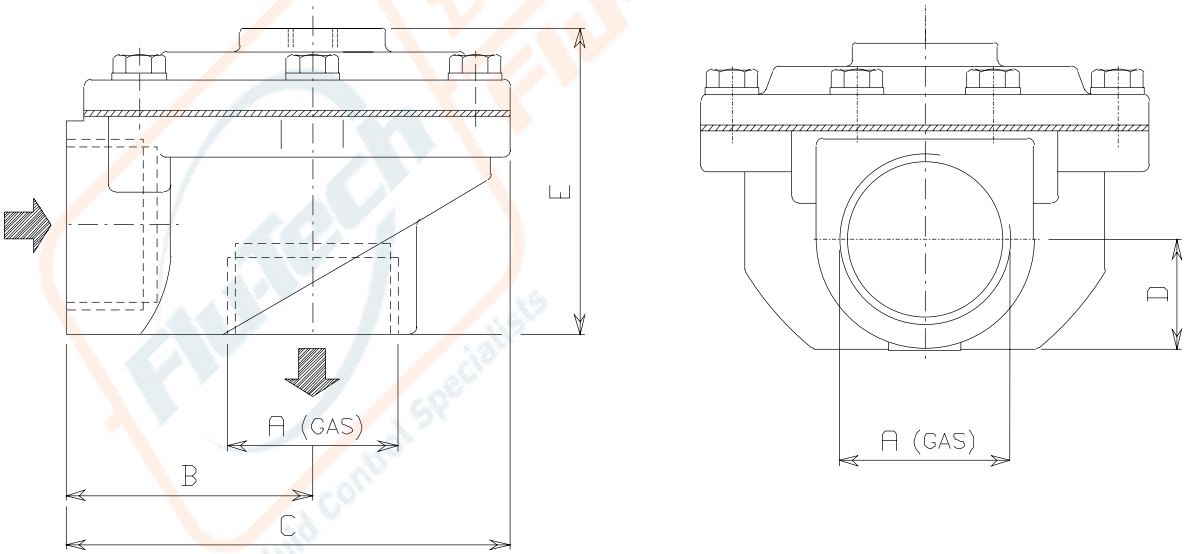
The 200 Series valves in stainless steel, are manufactured in AISI316L. These valves are particularly appropriate for installation in aggressive environments where there is risk of corrosion.

General Characteristics

Fluids: Filtered air and oil free
Diaphragm: *Standard*
NBR: −20°C/+80°C (-4°F/+176°F)
Viton: −29°C/+232°C (-20°F/+450°F)
Pressure Range: From 0.5 to 7.5 bar

Construction Features – Valve

Cover: AISI 316L
Body: AISI 316L
Pilot: Stainless steel
Spring: Stainless steel
Bolts and Screws: Stainless steel
Diaphragm Back Disk: Stainless steel



MODEL	ØA	B	C	D	E	E	ØL	Weight	Pressure Range		No. Diaph.
									Min	Max	
VXM-208-NPT	1" (25.4 mm)	2.05" (52 mm)	3.54" (90 mm)	0.91" (23 mm)	5.31" (135 mm)	2.36" (60 mm)	1/8"	1.87 lb (0.85 kg)	7.25 psi (0.5 BAR)	108.78 psi (7.5 BAR)	1
VXM-212-NPT	1-1/2" (38.1 mm)	2.83" (72 mm)	5.12" (130 mm)	1.22" (31 mm)	2.36" (60 mm)	3.35" (85 mm)	1/8"	5.27 lb (2.39 kg)	7.25 psi (0.5 BAR)	108.78 psi (7.5 BAR)	1

TROUBLESHOOTING DIAPHRAGM VALVES

PROBLEM	POSSIBLE CAUSE
Diaphragm valve fails to operate (open)	• No pressure in header • Low or no power to coil • Coil inoperative • Pilot valve plunger jammed shut • Pilot orifice blocked • Secondary bleed-hold blocked • Main diaphragm perforated • Secondary diaphragm perforated • Pilot valve connecting line too long • Silencer, if fitted, may be blocked
Diaphragm valve fails to shut	• Pilot valve plunger jammed open • Foreign matter under pilot valve • Secondary diaphragm spring broken • Foreign matter under secondary diaphragm • Main diaphragm spring broken • Foreign matter under main diaphragm • Main diaphragm seating disc damaged • Main bleed hole blocked • Secondary bleed hole blocked • Leak in line connecting pilot valve
Unable to build header pressure	• Excessive leakage from main diaphragm seat • Broken main valve spring • Secondary diaphragm not seating • Foreign matter under main or secondary diaphragm seat or under pilot valve seat • Air supply line too small • Compressor too small
Sluggish operation of diaphragm valve	• Partial blockage of one of the bleed-holes • Silencer, if fitted, may be blocked

TROUBLESHOOTING DIAPHRAGM VALVES *continued*

Special Note

To prevent premature failure of a diaphragm valve, special attention must be paid to the quality of the compressed air/gas being handled.

An adequate moisture and oil removal system must be incorporated that takes into account:

- Relative humidity likely to be experienced
- Ambient temperatures
- System operating temperatures
- Pressure drops (and associated temperature drops) through the valve and also through the blow tube holes (dew point problem)

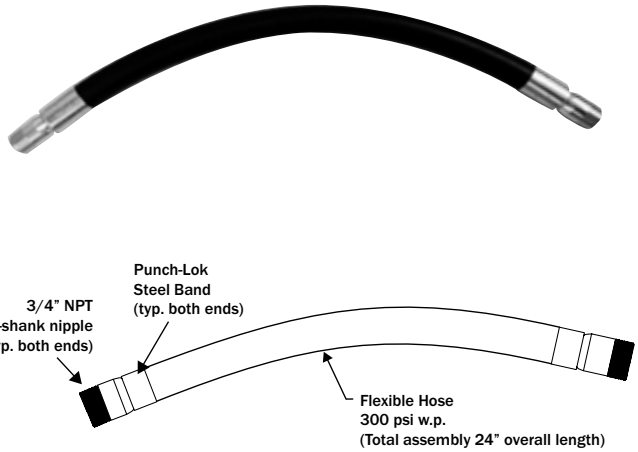
Also, small traces of chlorine and other aggressive gases, often present in filter systems, can be absorbed in wet areas resulting in corrosion and premature failure.

Apart from valve failures, systems may not perform to expectation for a number of reasons including the following:

- Inaccurate mounting/positioning of the AirSweep(s) relative to the vessel wall
- Inadequately sized header and/or compressed air supply
- Incorrect pulse time
- Incorrect intervals between pulses
- Improper adjustment or wear of AirSweep(s) piston head

FLEXIBLE HOSE ASSEMBLIES – 3/4" and 1-1/2"

Part No. J11512
3/4" (19.1 mm) ID



Hose Specifications

Dimensions: 3/4" (19.1 mm) ID x 24" (609.6 mm) overall length
1.109 (28.2 mm) OD

Tube: Black EPDM; ARPM Class C oil resistance

Cover: Black EPDM; smooth finish

Reinforcement: 2 textile plies

Temperature Range: -40°F to 212°F
(-40°C to 100°C)

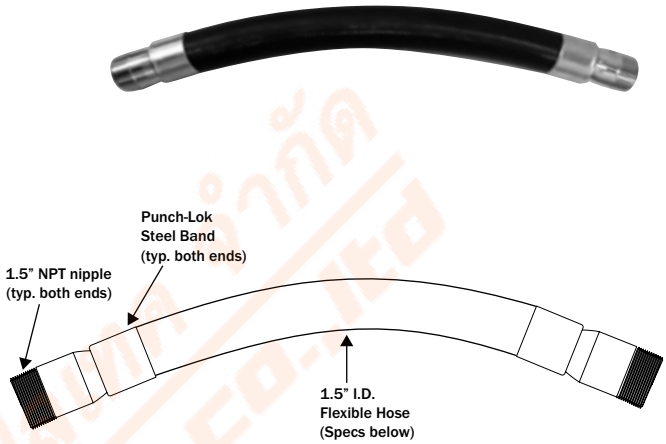
Working Pressure: 125 PSI (0.86 Mpa)
(Max. Rec WP 200 psi/13.8 bar -WARNING! Couplings attached with bands or clamps may reduce the working pressure of the hose assembly to less than the maximum rated working pressure of the hose. Refer to the NAHAD Industrial Hose Assembly Guidelines).

Bend Radius: 6.0 in / 152.4 mm

Male Nipple: 3/4" NPT plated steel

Punch-Lok Band Clamps: both ends

Part No. J11524
1-1/2" (38.1 mm) ID



Hose Specifications

Dimensions: 1-1/2" (38.1 mm) ID x 24" (609.6 mm) overall length
2.031 (51.6 mm) OD

Tube: Black EPDM; ARPM Class C oil resistance

Cover: Black EPDM; smooth finish

Reinforcement: 4 textile plies

Temperature Range: -40°F to 180°F
(-40°C to 82°C)

Working Pressure: 125 PSI (0.86 Mpa)
(Max. Rec WP 200 psi/13.8 bar -WARNING! Couplings attached with bands or clamps may reduce the working pressure of the hose assembly to less than the maximum rated working pressure of the hose. Refer to the NAHAD Industrial Hose Assembly Guidelines).

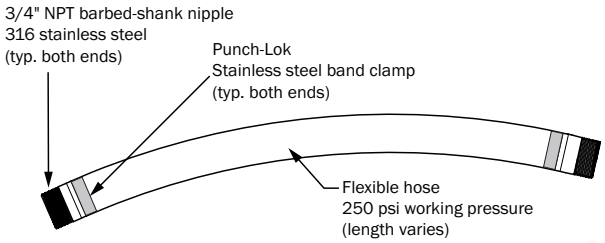
Bend Radius: 10.0 in / 254 mm

Male Nipple: 1-1/2" NPT plated steel

Punch-Lok Band Clamps: both ends

Food-Grade FLEXIBLE HOSE ASSEMBIES – 3/4" and 1-1/2"

Part No. J11512-FG
3/4" (19.1 mm) ID



Hose Specifications

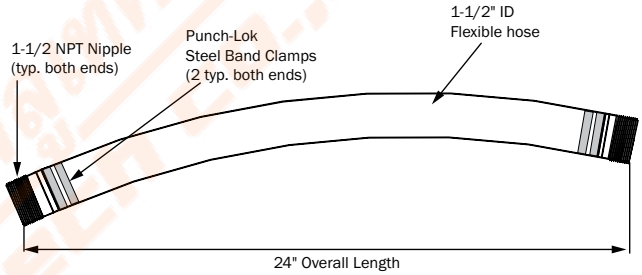
Max. Working Pressure: 300 psi, 2.07 MPa
Hose ID: 3/4" (19.10 mm)
Hose OD: 1.190" (30.20 mm)
Tube: White FDA compliant nitrile synthetic rubber.
Reinforcement: Spiral synthetic yarn.
Cover: Blue Carbryn™ synthetic rubber, RMA Class A (High Oil Resistance) with Microban® product protection.
Temperature: Min. -20°F (-29°C)
Max. 200°F (93°C)
Branding: BLUE FORTRESS®

Nipple/Banding Specifications

Barbed shank nipple, 316 stainless steel, 3/4 Male NPT

Punch-Lok stainless steel band, both ends

Part No. J11524-FG
1-1/2" (38.1 mm) ID



Hose Specifications

Max. Working Pressure: 150 psi, 1.03 MPa
Hose ID: 1-1/2" (38.10 mm)
Hose OD: 1.970" (50.00 mm)
Bend Radius: 4" (102 mm)
Tube: White Chemivic™ synthetic rubber (FDA/USDA compliant and conforms to 3-A sanitary standard 18-03).
Reinforcement: Spiral-plied synthetic fabric with galvanized wire helix.
Cover: Gray Chemivic synthetic rubber (wrapped impression).
Temperature: Min. -25°F (-32°C)
Max. 230°F (110°C)
Branding: PLICORD®

Nipple/Banding Specifications

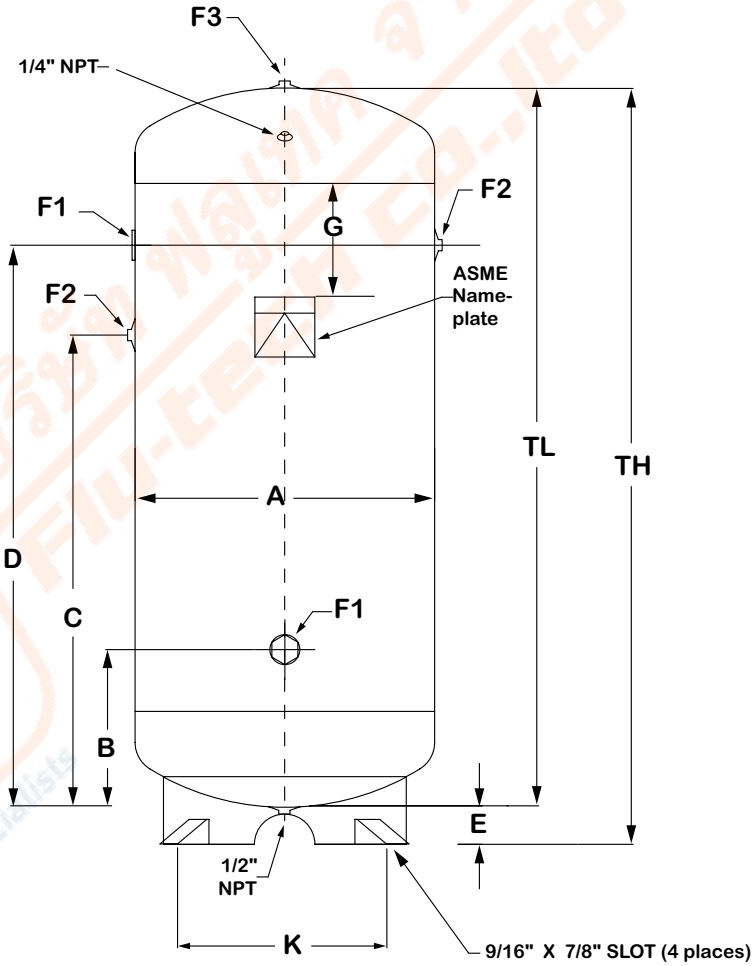
Male nipple, 1-1/2 NPT, both ends, 316 stainless steel

Double Punch-Lok, stainless steel bands, both ends

AIR RECEIVERS

Part Nos. J32202 (30 gal), **J32203** (60 gal), **J32204** (80 gal), **J32225** (120 gal)

Model	Capacity		MAWP	Wt.
J32202	30 gal (114 l)	4.0 ft³ (0.11 m³)	200 psi@ 650°F (1379 kPa @ 343°C)	85 lb (38.6 kg)
J32203	60 gal (227 l)	8.0 ft³ (0.23 m³)	200 psi @ 400°F (1379 kPa @ 20°C)	159 lb (72.1 kg)
J32204	80 gal (303 l)	10.7 ft³ (0.30 m³)	200 psi@ 650°F (1379 kPa @ 343°C)	220 lb (99.8 kg)
J32225	120 gal (454 l)	16 ft³ (0.45 m³)	200 psi @ 400°F (1379 kPa @ 204°C)	355 lb (161.0 kg)

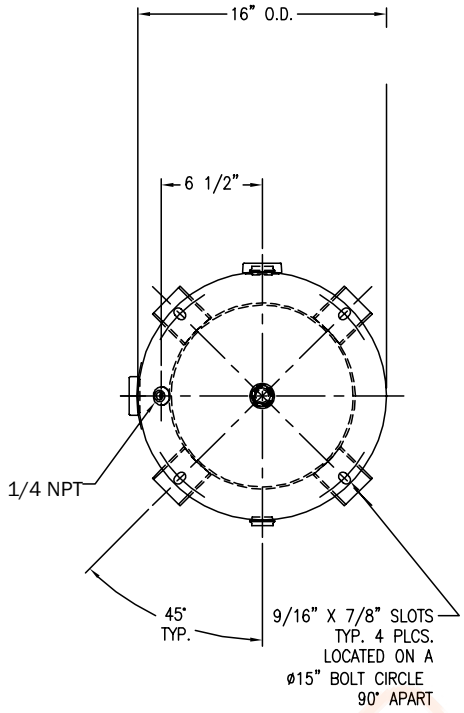


										NPT Size		
Model	**A (ID)**	**TL**	**TH**	**B**	**C**	**D**	**E**	**G**	**K (OD)**	**F1**	**F2**	**F3**
J32202	16" (40.6 cm)	38" (96.5 cm)	40-13/16" (103.7 cm)	9-3/4" (24.8 cm)	22-1/4" (56.5 cm)	28-1/4" (71.8 cm)	2-13/16" (7.1 cm)	6-1/2" (16.5 cm)	12" (30.5 cm)	1-1/2 (40 mm)	3/4 (20 mm)	3/4 (20 mm)
J32203	20" (50.8 cm)	48" (122.0 cm)	50-11/16" (128.7 cm)	11" (11.0 cm)	31" (78.7 cm)	37" (94.0 cm)	2-11/16" (6.8 cm)	7" (17.8 cm)	14" (35.6 cm)	2 (50 mm)	3/4 (20 mm)	3/4 (20 mm)
J32204	24" (61.0 cm)	46" (116.8 cm)	49-3/16" (124.9 cm)	9-7/8" (25.1 cm)	31-1/8" (79.1 cm)	36-1/8" (91.8 cm)	3-3/16" (8.1 cm)	6" (15.2 cm)	18" (45.7 cm)	2 (50 mm)	1-1/4 (32 mm)	1-1/4 (32 mm)
J32225	30" (76.2 cm)	46" (116.8 cm)	54" (137.2 cm)	13" (33.0 cm)	27" (68.6 cm)	33" (83.8 cm)	8" (20.3 cm)	5" (12.7 cm)	24" (61.0 cm)	2 (50 mm)	2 (50 mm)	2 (50 mm)

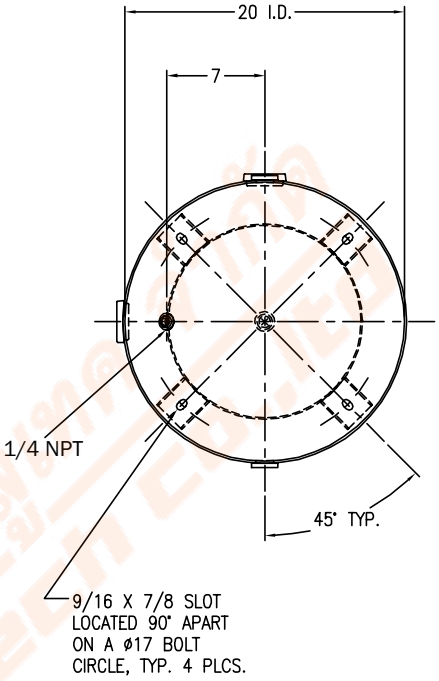
AIR RECEIVERS *continued*

Part Nos. J32202 (30 gal), **J32203** (60 gal), **J32204** (80 gal), **J32225** (120 gal)

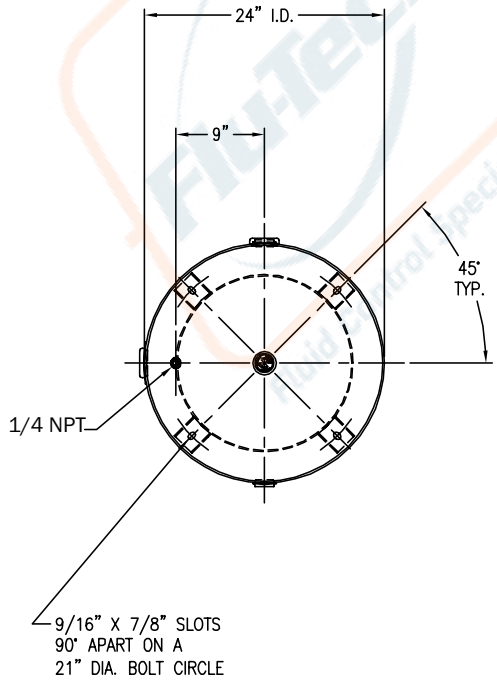
Model J32202
30 gal - Bolt Hole



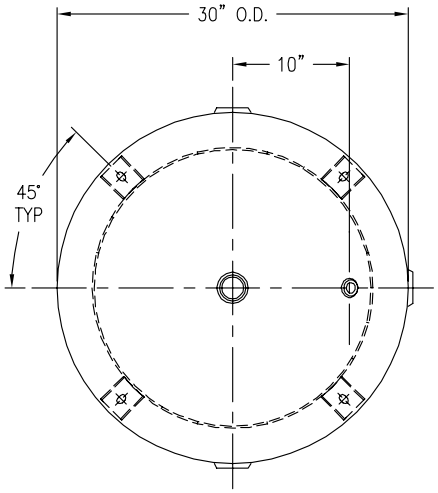
Model J32203
60 gal - Bolt Hole



Model J32204
80 gal - Bolt Hole



Model J32225
120 gal - Bolt Hole



AIR RECEIVER Tank Kit Components (Part No. TK12230-F)

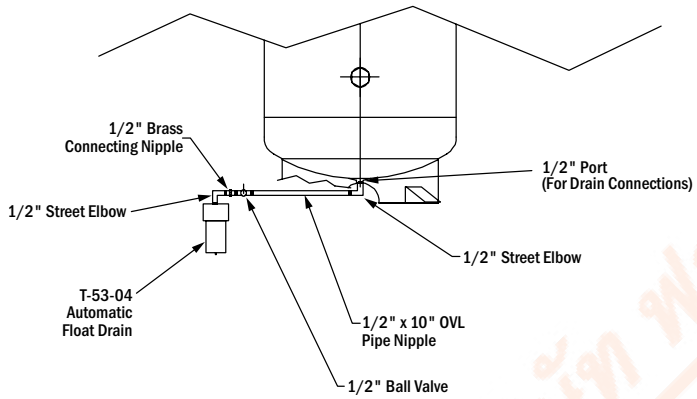
with T-53-04 Drain Trap

Air Receiver Tank Kit

Part No. TK12230-F

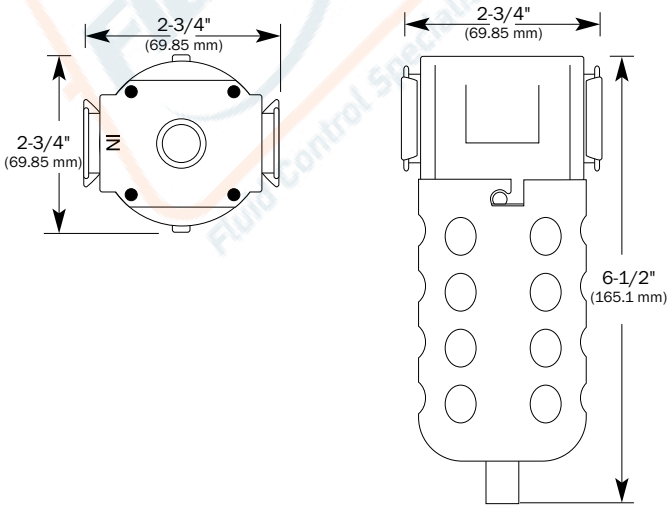
Tank kit for air receivers, includes pressure gauge, safety relief valve, auto drain (T-53-04), ball valve and connecting nipples.

Air Receiver Float Drain Connection Details



T-53-04 WATER DRAIN

- Automatically expels liquids from piping network in compressed air systems
- Use in low spots in an air system where water is likely to accumulate
- Float type drain features a protective stainless steel screen with umbrella baffle, providing large sump area for oil, sludge and dirt
- Max pressure: 175 psi (12.07 Bar)
- Temperature: 40° to 120° F (4 to 49° C)
- 1/2" NPT



Brass In-Line Check Valves

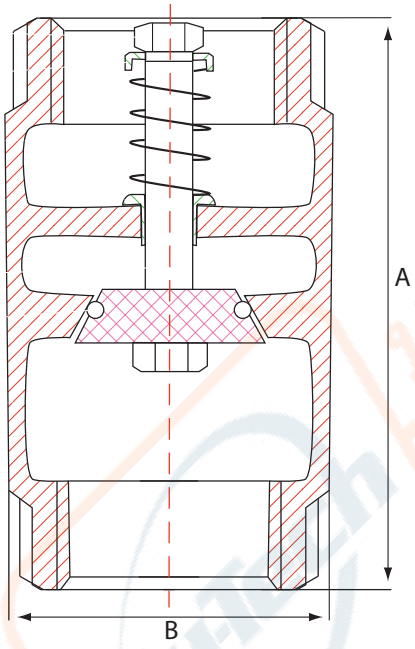
Part Nos. 61105 (1"), 61107 (1-1/2") and 61108 (2")

Prevents reverse-flow with minimum change in flow velocity.

- Rated at 200 psi
- Cast brass
- Spring loaded
- Stainless steel spring
- Opens at 2 psi
- ISO 9001:2008 manufacturer

Note: Product contains brass which does not meet federal and state requirements for drinking water.

WARNING: Cancer and Reproductive Harm
www.P65Warnings.ca.gov



Dimensions				
Model	**Size**	**A**	**B**	**Weight**
61105	1" (25 mm)	3.23" (82.04 mm)	1.77" (44.96 mm)	0.9 lb (0.41 kg)
61107	1-1/2" (38 mm)	4.04" (102.62 mm)	2.36" (59.94 mm)	1.5 lb (0.68 kg)
61108	2" (50 mm)	5.04" (128.02 mm)	3.03" (76.96 mm)	3.5 lb (1.59 kg)

3.0 Micron Particulate Filter

F901G Series (Part Nos. F901G-08AG, F901G-12AG, F901G-16AG)

The particulate filter is designed for heavy dirt loading. Large particles such as rust, desiccant dust, and debris will often reduce the life of pneumatic components. Contaminant is generated from desiccant type air dryers, older carbon steel pipes, andfrom the intake of a compressor.

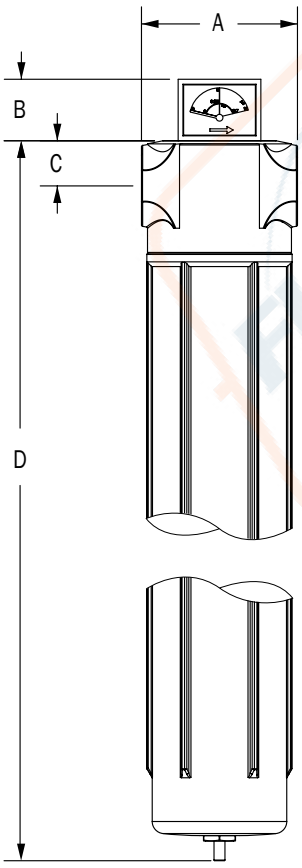
The particulate 3.0 micron filter element features a pleated design - consisting of cellulose composite media which provides a large amount of surface area and extends the life of the element. When air flows - from the outside of the element to the inside, the particles are trapped in the space between the filter bowl and the element.

Recommended Uses:

- Solid bulk contamination removal
- Afterfilter to a desiccant dryer
- Protection for coalescers in heavy aerosol applications
- 3 micron particle removal in 'dry' systems

Materials of Construction:
Body – Aluminum
Seals – Fluorocarbon (FKM)
Drain – Brass
End Cap – Anodized Aluminum

ANSI SYMBOL



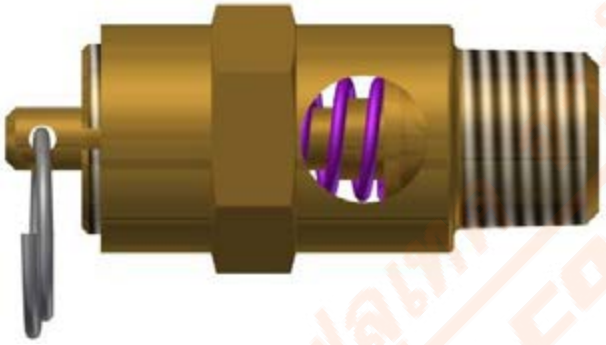
Flow Ratings				
Model	Port Size	SCFM Based on 100 PSI (7 bar) inlet	m³/h Based on 100 PSI (7 bar) inlet	ΔP
F901G-08AG	1" (25.4 mm)	305	518	1.5 PSID
F901G-12AG	1-1/2" (38.1 mm)	606	1030	1.5 PSID
F901G-16AG	2" (50.8 mm)	1155	1962	1.5 PSID

Note: Maximum efficiency occurs at stated flows.

Dimensions						
Model	Port Size	A	B	C	D	Weight
F901G-08AG	1" (25.4 mm)	4.6" (116 mm)	1.8" (46 mm)	1.32" (34 mm)	14.69" (373 mm)	7.10 lb (3.22 kg)
F901G-12AG	1-1/2" (38.1 mm)	4.6" (116 mm)	1.8" (46 mm)	1.32" (34 mm)	21.07" (535 mm)	9.25 lb (4.20 kg)
F901G-16AG	2" (50.8 mm)	6.3" (160 mm)	1.8" (46 mm)	1.69" (43 mm)	26.80" (681 mm)	22.7 lb (10.30 kg)

Note: 1.8" (46 mm) space is needed below the bottom of the bowl in order to remove the bowl.

Pressure Relief Valve
Model: SRV250



Set Pressure Range: 25-450 psig

Set Pressure Tolerance: ±2 psig up to and including 70 psig, ±3% of set pressure greater than 70 psig. As required in paragraph UG-134(d)(1) of the ASME Boiler & Pressure Vessel Code Sec. VIII Div. 1.

Seat Leakage:

Bubble Tight within 5 psig for set pressure 50 psig or less
Bubble Tight within 10% for set pressure greater than 50 psig
As required in paragraph 2.2.3 of API 527.

Flow Factor (Slope Method): 0.74

Operating Temperature Range: -65° to 400°F

Materials of Construction:

Seat, Cap, Piston: ASTM B16 Brass or ASTM A582 Stainless
Spring: 17-7 Stainless Steel
Seal: Silicone or Viton

Valve Weight: 0.10 lbm

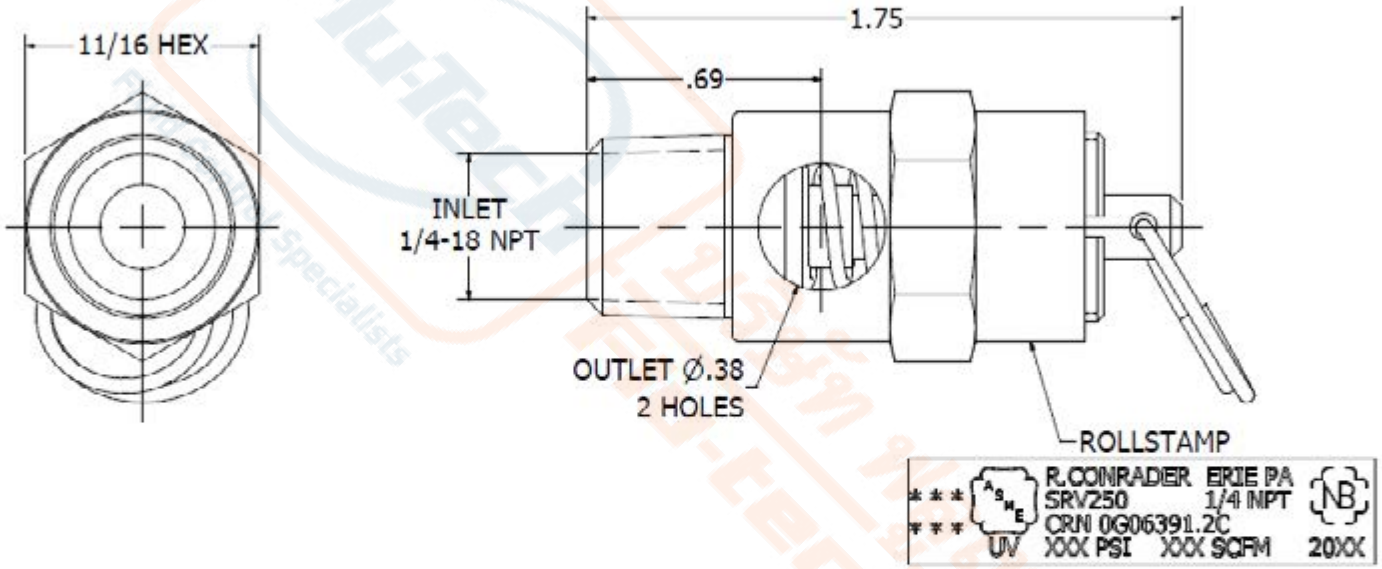
Valve Options:

Valve Material: ASTM B16 Brass or ASTM A582 Stainless
Compliance with European PED 2014/68/EU, "CE" Stamp
Seal: Silicone (25-350 psig @ -65°to 400°F) or Viton (25-450 psig @ -15° to 400°F)
High Pressure Setting 351-450 psi (Valve Weight 0.11 lbm)
Plating: Nickel Plating
Inlet NPT Sizes: 1/8 NPT or BSPT
1/4 NPT or BSPT
3/8 NPT or BSPT

Certifications:

ASME Boiler & Pressure Vessel Code Section VIII Division 1
CSA B51-03 Boiler, Pressure, Vessel, and Pressure Piping Code

THIRD ANGLE PROJECTION

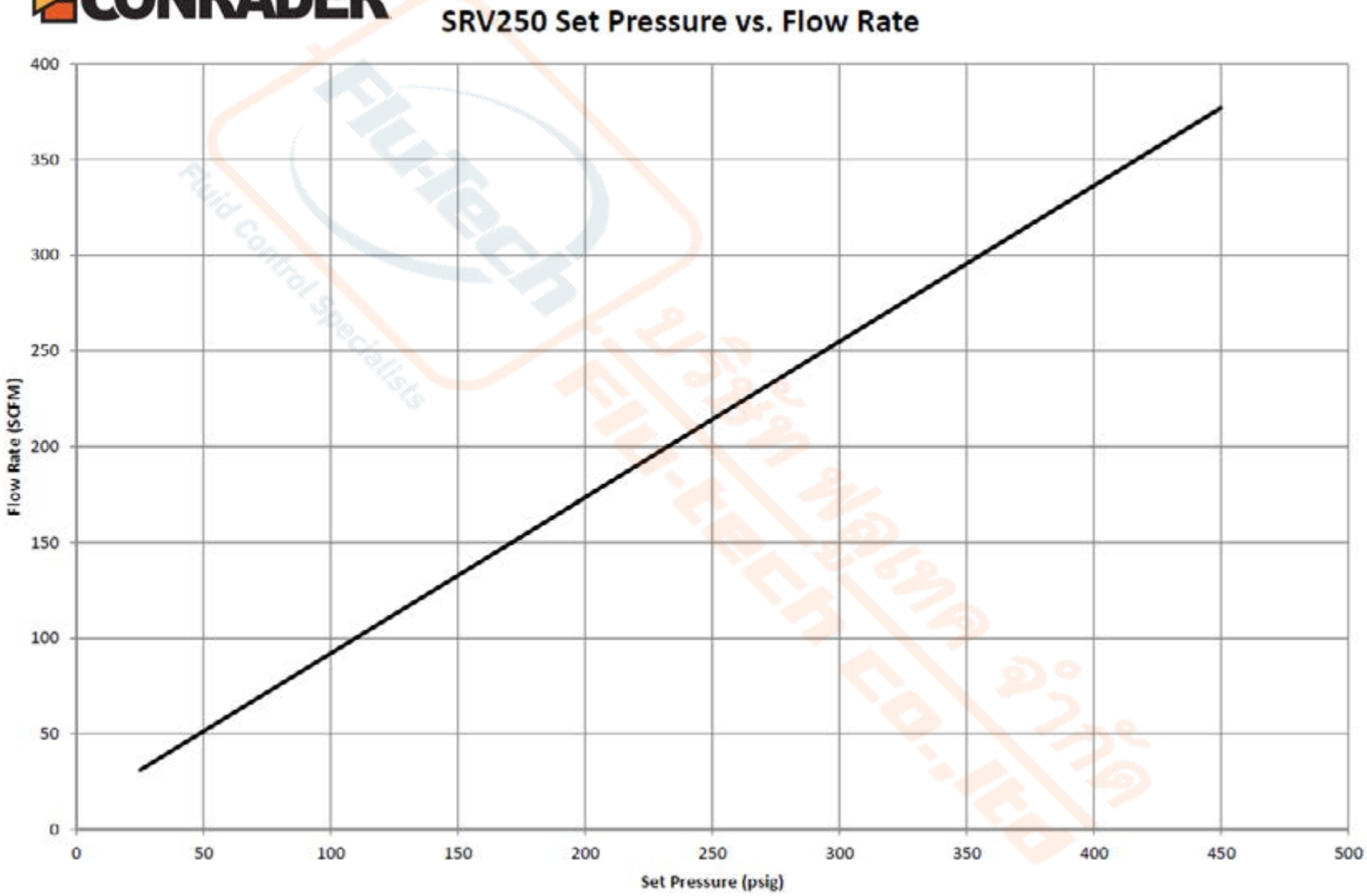


NOTES:
* OPERATING TEMPERATURE RANGE: -65°F TO 400°F
* SET PRESSURE RANGE: 25-350 psig
* SET PRESSURE TOLERANCE: ±2 psig UP TO AND INCLUDING 70 psig, ±3% OF SET PRESSURE GREATER THAN 70 psig.
* SEAT TIGHTNESS: BUBBLE TIGHT WITHIN 5 psig FOR SET PRESSURE 50 psig OR LESS. BUBBLE TIGHT WITHIN 10% FOR SET PRESSURE GREATER THAN 50 psig.
* VALVE WEIGHT: 0.10 lbmass

CONRADER VALVES
R. CONRADER COMPANY
749 EAST 10TH STREET P.O. BOX 924
ERIE, PA 16512-0924 (814) 898-7777

DESCRIPTION	ISSUED BY	ISSUED	GROUP
DIM. OUTLINE	L.CONTI	8/22/1994	SV
VALVE MODEL	REVISED BY	REVISED	PAGE 2 OF 4
SRV250-1/4	NRP	1/20/2016	
MATERIAL	SCALE	DRAWING NO.	REVISION
	2:1	1299	I

CONRADER

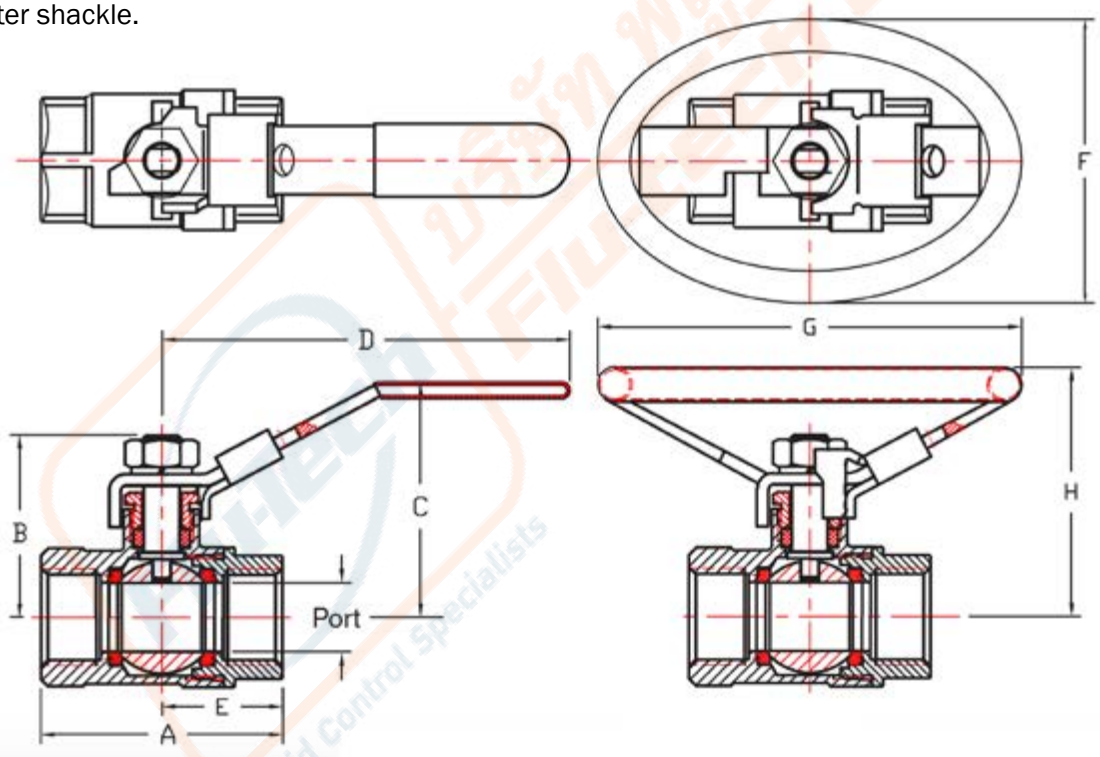


Brass Ball Valves

Part Nos. LHBV-75 (3/4"), LHBV-100 (1"), LHBV-150 (1-1/2"), LHBV-200 (2")

Max. Pressure: 1/4" - 2", 600 psi@100°F (Water, Oil, Inert Gas)
2-1/2" - 4", 450 psi @ 100°F
Max. Pressure for Steam: 150 psi @ 366°F
Temperature Range: -50 to +400°F
Vacuum Rating: 29.9 Hg
Additional Specifications: NPT Female to Female

- Lockable Lever
- Body is brass, ball is chrome-plated brass, and seats are PTFE
- Valves have unrestricted flow (full port).
- Valves with up to 2" pipe size or tube size are UL and C-UL certified.
- NPT Female x Female have fluoroelastomer seal. T-Handle valves have PTFE seal.
- All are CSA and CSA-US certified. Valves with up to 2" pipe size are FM approved.
- Lockable valves can be padlocked (not included) with 9/32" diameter shackle.



Part No.	Pipe Size	A	B	C	D	E	F	G	H
LHBV-75	3/4" (1.91 cm)	2.37" (6.02 cm)	1.81" (4.60 cm)	2.48" (6.30 cm)	4.72" (11.99 cm)	1.19" (3.02 cm)	2.55" (6.48 cm)	3.78" (9.60 cm)	1.69" (4.29 cm)
LHBV-100	1" (2.54 cm)	2.89" (7.34 cm)	1.96" (4.98 cm)	2.63" (6.68 cm)	4.72" (11.99 cm)	1.45" (3.68 cm)	2.55" (6.48 cm)	3.78" (9.60 cm)	1.69" (4.29 cm)
LHBV-150	1-1/2" (3.81 cm)	3.62" (9.19 cm)	2.73" (6.93 cm)	3.16" (8.03 cm)	6.14" (15.60 cm)	1.81" (4.60 cm)	3.30" (8.38 cm)	4.65" (11.81 cm)	1.93" (4.90 cm)
LHBV-200	2" (5.08 cm)	4.40" (11.18 cm)	3.00" (7.62 cm)	3.44" (8.74 cm)	6.14" (15.60 cm)	2.20" (5.59 cm)	3.30" (8.38 cm)	4.65" (11.81 cm)	1.93" (4.90 cm)

High-Flow Regulator – R50 Series

Part Nos. R50R-08G (1" ports) and R50R-12G (1-1/2" ports)

Includes Gauge

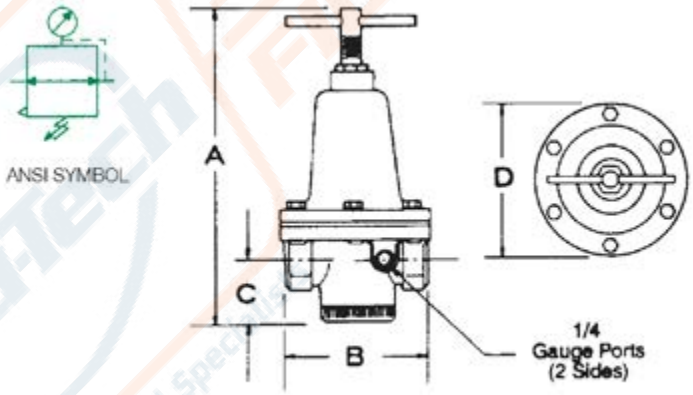
- Diaphragm-operated regulator
- T-handle standard
- Standard output pressure 0-125 PSIG

Specifications, both models:

Temperature Range: 40° to 120°F (4° to 46.9° C)
Max Pressure: 300 PSIG (20.7 bar)
Weight: 7.2 lbs (3.3 kg)

Flow Ratings				
Part No.	Pipe Size	SCFM* at Reduced Pressure of		
		25 PSIG	60 PSIG	80 PSIG
R50R-08G	1"	370	385	395
R50R-12G	1-1/2"	370	385	395

** Flow rates based on 100 PSIG inlet and 25% PSID.*



Dimensions					
Model	Pipe Size	A	B	C	D
R50R-08G	1"	8.81" (224.0 mm)	4.56" (116.0 mm)	1.94" (24.0 mm)	7.88" (200.0 mm)
R50R-12G	1-1/2"	9.53" (242.0 mm)	5.19" (132.0 mm)	1.28" (33.0 mm)	8.25" (210.0 mm)

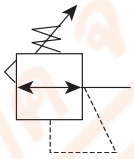
High-Flow Regulator

Part No. 09R813B (2", no gauge)

The 09R non-modular high flow regulator reduces a supplied air pressure to desired outlet pressure. It provides a quick response and accurate pressure regulation for the most demanding industrial applications.

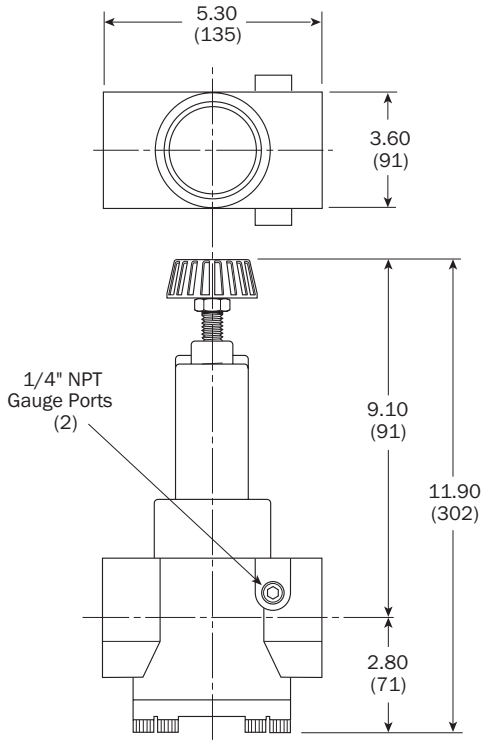
Pressure regulators transform a fluctuating air supply to a relatively constant reduced air pressure within the operating range of the regulator itself.

- Piston design for reduced downtime
- High flow
- Balanced poppet for quick and accurate regulation
- Self-relieving piston standard



ANSI SYMBOL

Operating information:	
Supply pressure (max)	300 PSIG (0 to 20.7 bar)
Secondary pressure range	10 to 125 PSIG (0.7 to 8.6 bar) 10 to 180 PSIG (0.7 to 12.4 bar)
Operating temperature	32°F to 150°F (0°C to 65.6°C)
Flow capacity† High flow	1000 scfm (472 dm^3/s, ANR)
Weight	10.82 lb (53 kg)
†scfm = Standard cubic feet per minute at 100 psig inlet, 90 psig no flow secondary setting and 10 psig pressure drop.	
Material Specifications	
Adjusting stem & springs	Steel
Body	Zinc Alloy
Bonnet, piston stem, valve poppet & cap	Aluminum
Piston, cap	Plastic
Seals	Nitrile
Repair and Service Kits	
Body service kit	PS603P
2" dial face 160 PSIG (0 to 11.0 bar), gauge	K4520N14160
2" dial face 300 PSIG (0 to 20.7 bar), gauge	K4520N14300
1-3/4" digital round face 160 PSIG (0 to 11.0 bar), gauge	K4517N14160D
Mounting bracket kit	PS605P
Non-relieving	PS604P
Relieving	PS626P
0 to 125 PSIG spring	PS602P
0 to 180 PSIG spring	PS627



Inches (mm)

CAUTION:

REGULATOR PRESSURE ADJUSTMENT – The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

⚠ WARNING

Product rupture can cause serious injury.
Do not connect regulator to bottled gas.
Do not exceed Maximum primary pressure rating.

CBO-SERIES AIRSWEEP® CONTROL BOXES

The control box is the heart of the AirSweep® system. This device fires the AirSweeps in a prescribed sequence, at a prescribed interval, to assure on-demand or even discharging of material from the bin, silo, chute or other vessel.

The firing order should be set from the discharge, or lowest unit, to the upper units.

The burst signal, sent from the control box to the solenoid valves, is typically set at 0.25 seconds. This signal is responsible for the actual firing of any given AirSweep. In some cases, more than one solenoid valve may be wired to the same output, to effect simultaneous firing of two AirSweeps.

The interval timer governs the "dwell" between successive firings.

The "dwell" should be set as long as possible without adversely affecting the flow of material. **A longer "dwell" will conserve air.**

External controls, if included on the control box, consist of a rotary ON/OFF switch and a push button labeled "JOG". The "JOG" button is intended to provide manual assistance of rapid firing of the AirSweeps in times of unusual material hang-ups or when increased material flow is required.

WARNING

NEVER ALLOW ANYONE TO LOOK INTO OR ENTER BIN WHEN AIRSWEEPS ARE OPERATING.

EYE OR OTHER INJURY MAY RESULT!

SHUT OFF ELECTRIC & AIR SUPPLY TO AIRSWEEPS AND DISCHARGE AIR IN SYSTEM BEFORE INSPECTING OR SERVICING AIRSWEEPS.

1-4 Output Sequence Controllers

Part Nos. CBO 4 and CBO 4-220 (board only)

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 110/120 VAC, 50/60 Hz supply to terminals H & N.
   For CBO 4-220, connect 220/230 VAC, L1 to (N), L2 to (H).
3. Connect one wire of each solenoid (load) to terminals 1 - 4 (as required). Connect the remaining (common) wire from solenoid to terminal N. Output rating is 3 amps at 115 VAC, maximum (3 amps at 230 VAC, for CBO 4-220).

Sequence

Output #1, then #2, and so on to last selected output. Sequence will then repeat, beginning at output #1. Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting Total Number of Outputs

If less than 4 outputs are desired, remove the program jumper from the socket by pulling lightly until it retracts.
Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges* *(standard, as supplied by factory)*

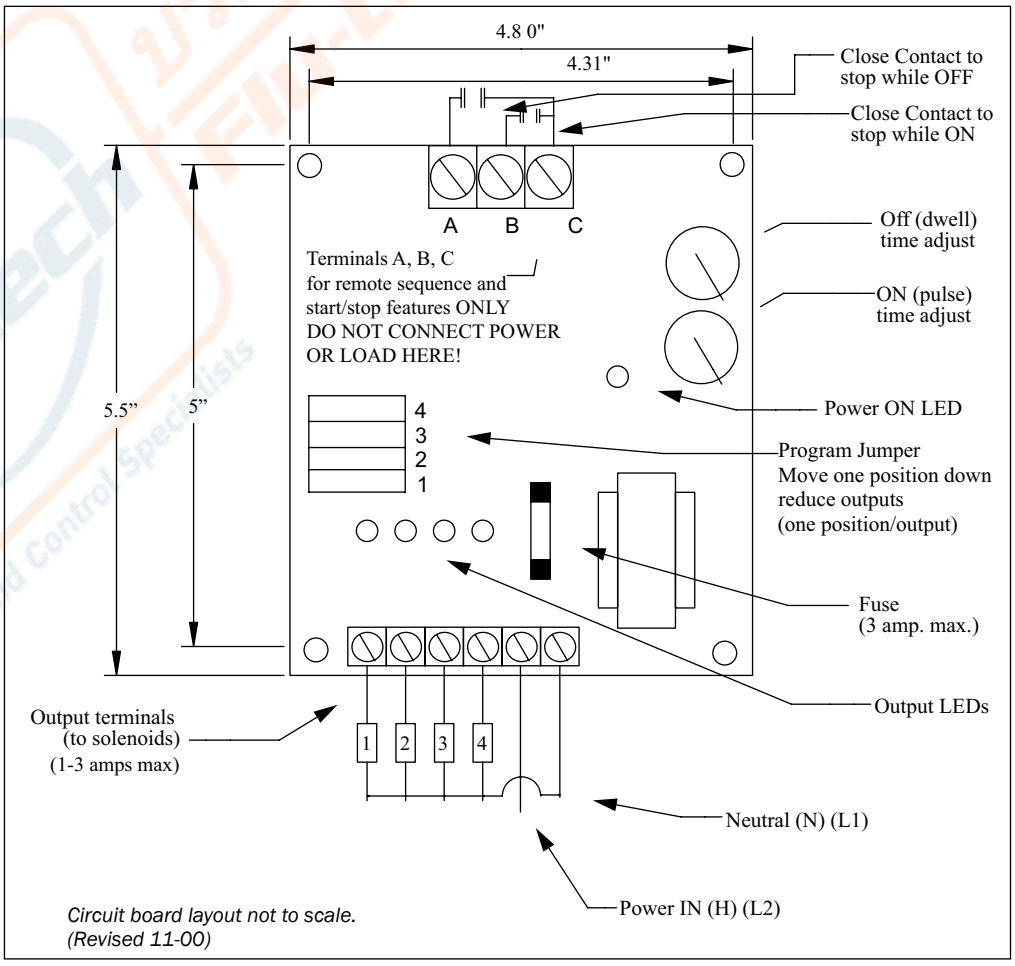
On time range: 30 milliseconds to 1.2 seconds

Off (dwell) time range: 2 seconds to 2 minutes.

**OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.*

16 VDC capacitor values and corresponding time ranges shown in the chart below. Other times available by special order.

Time Range	Value (mfd)
16 to 600 milliseconds	0.1
30 milliseconds to 1.2 seconds	0.2
0.1 to 6 seconds	1.0
0.2 to 12 seconds	2.2
0.3 to 20 seconds	3.3
1 to 60 seconds	10.0
2 seconds to 2 minutes	22.0
15 seconds to 10 minutes	100.0
30 seconds to 20 minutes	220.0
1 to 45 minutes	470.0



Circuit board layout not to scale.
(Revised 11-00)

1-4 Output Sequence Controllers (12 or 24 VDC)

Part No. CBO 4-DC (board only)

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 12 or 24 VDC supply to terminals H & N (Minus to -, Plus to +).
3. Connect one wire of each solenoid (load) to terminals 1 - 4 (as required). Connect the remaining (common) wire from solenoid to terminal (-). Output rating is 5 amps at 12 or 24 VDC, maximum.

Sequence

Output #1, then #2, and so on to last selected output. Sequence will then repeat, beginning at output #1. Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting Total Number of Outputs

If less than 4 outputs are desired, remove the program jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges* *(standard, as supplied by factory)*

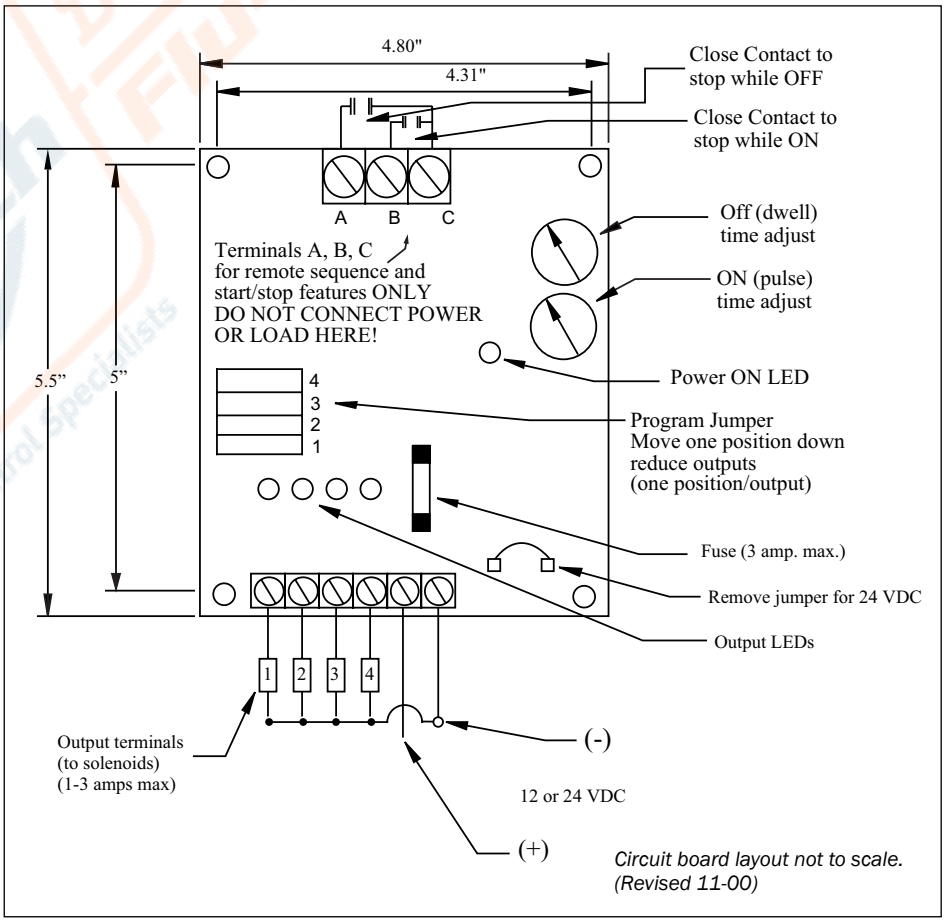
On time range: 30 milliseconds to 1.2 seconds

Off (dwell) time range: 2 seconds to 2 minutes.

**OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.*

16 VDC capacitor values and corresponding time ranges shown in the chart below. Other times available by special order.

Time Range	Value (mfd)
16 to 600 milliseconds	0.1
30 milliseconds to 1.2 seconds	0.2
0.1 to 6 seconds	1.0
0.2 to 12 seconds	2.2
0.3 to 20 seconds	3.3
1 to 60 seconds	10.0
2 seconds to 2 minutes	22.0
15 seconds to 10 minutes	100.0
30 seconds to 20 minutes	220.0
1 to 45 minutes	470.0



10 Output Sequence Controllers

Part No. CBO 10 (board only)

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 110/120 VAC, 50/60 Hz supply to terminals H & N.
   For CBO 10-220, connect 220/230 VAC, L1 to (N), L2 to (H).
3. Connect one wire of each solenoid (load) to terminals 1 - 10 (as required). Connect the remaining (common) wire from solenoid to terminal N. Output rating is 3 amps at 115 VAC, maximum (3 amps at 220 VAC, for CBO 10-220).

Sequence

Output #1, then #2, and so on to last selected output. Sequence will then repeat, beginning at output #1. Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting Total Number of Outputs

Number of outputs is determined by the position of the proper jumper, which is generally shipped in the #9 position. If 10 outputs are desired, the jumper should be removed. If less than 10 outputs are desired, remove the jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

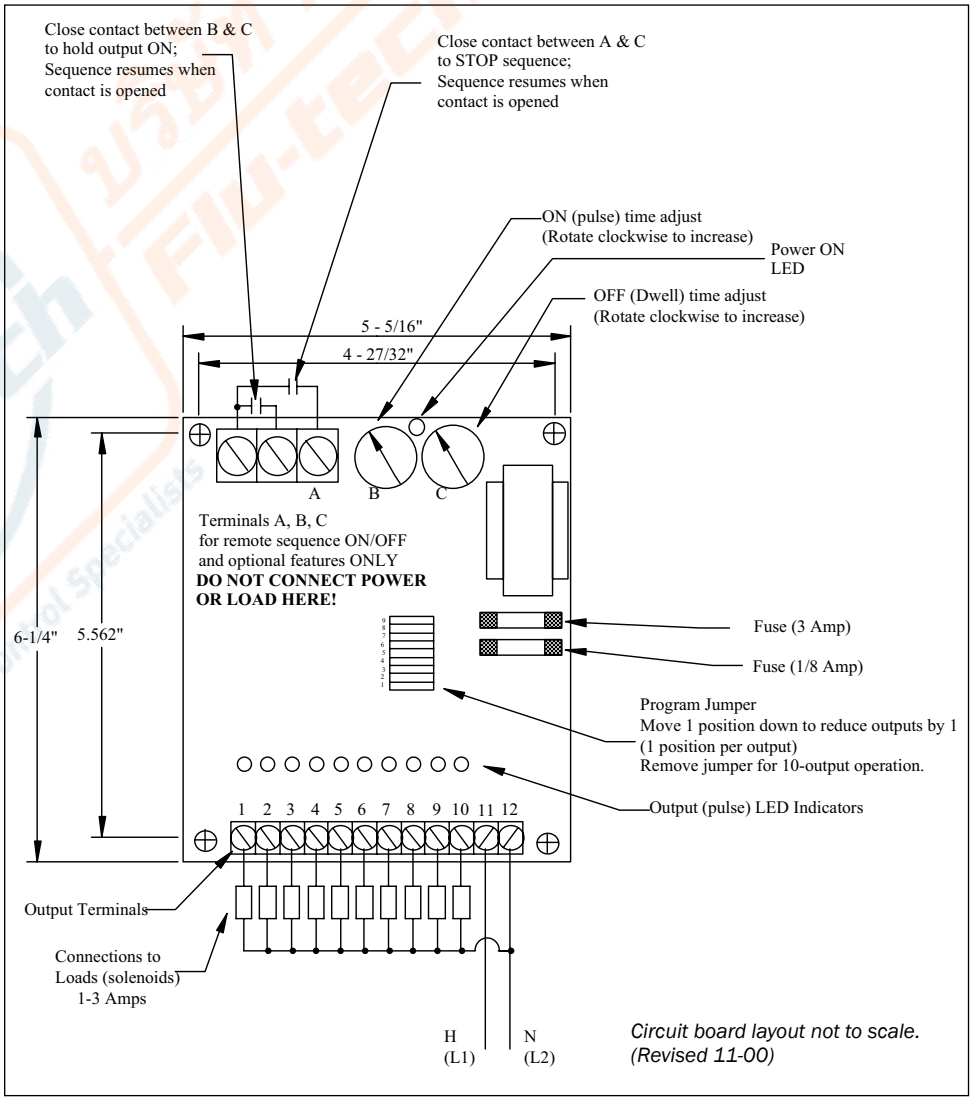
Adjustable time ranges* *(standard, as supplied by factory)*

On time range: 30 milliseconds to 1.2 seconds
Off (dwell) time range: 2 seconds to 2 minutes.

**OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.*

16 VDC capacitor values and corresponding time ranges shown in the chart below. Other times available by special order.

Time Range	Value (mfd)
16 to 600 milliseconds	0.1
30 milliseconds to 1.2 seconds	0.2
0.1 to 6 seconds	1.0
0.2 to 12 seconds	2.2
0.3 to 20 seconds	3.3
1 to 60 seconds	10.0
2 seconds to 2 minutes	22.0
15 seconds to 10 minutes	100.0
30 seconds to 20 minutes	220.0
1 to 45 minutes	470.0



10 Output Sequence Controllers (12 or 24 VDC)

Part No. CBO 10-DC (board only)

Installation

1. Mount the control or enclosure in any convenient location. Direction of the control does not affect performance.
2. Connect 12 or 24 VDC supply to terminals 11 & 12 (Minus[-] to 12, Plus[+] to 11).
3. Connect one wire of each solenoid (load) to terminals 1 - 10 (as required). Connect the remaining (common) wire from solenoid to terminal (-). Output rating is 5 amps at 12 or 24 VDC, maximum.
4. For 24 VDC, remove red jumper.

Sequence

Output #1, then #2, and so on to last selected output. Sequence will then repeat, beginning at output #1. Sequence will always begin at output #1 at power-up.

Remote Stop Function

Sequence can be paused via remote switch or relay by closing circuit between terminals A and C. When circuit is re-opened, sequence will resume at the point where it was stopped.

Selecting Total Number of Outputs

If less than 10 outputs are desired, remove the program jumper from the socket by pulling lightly until it retracts. Reinsert the jumper in the numbered position corresponding to the amount of outputs desired. Sequence will begin at #1 position, cycle through consecutive outputs, and repeat the sequence after reaching the output corresponding to jumper position.

Adjustable time ranges* *(standard, as supplied by factory)*

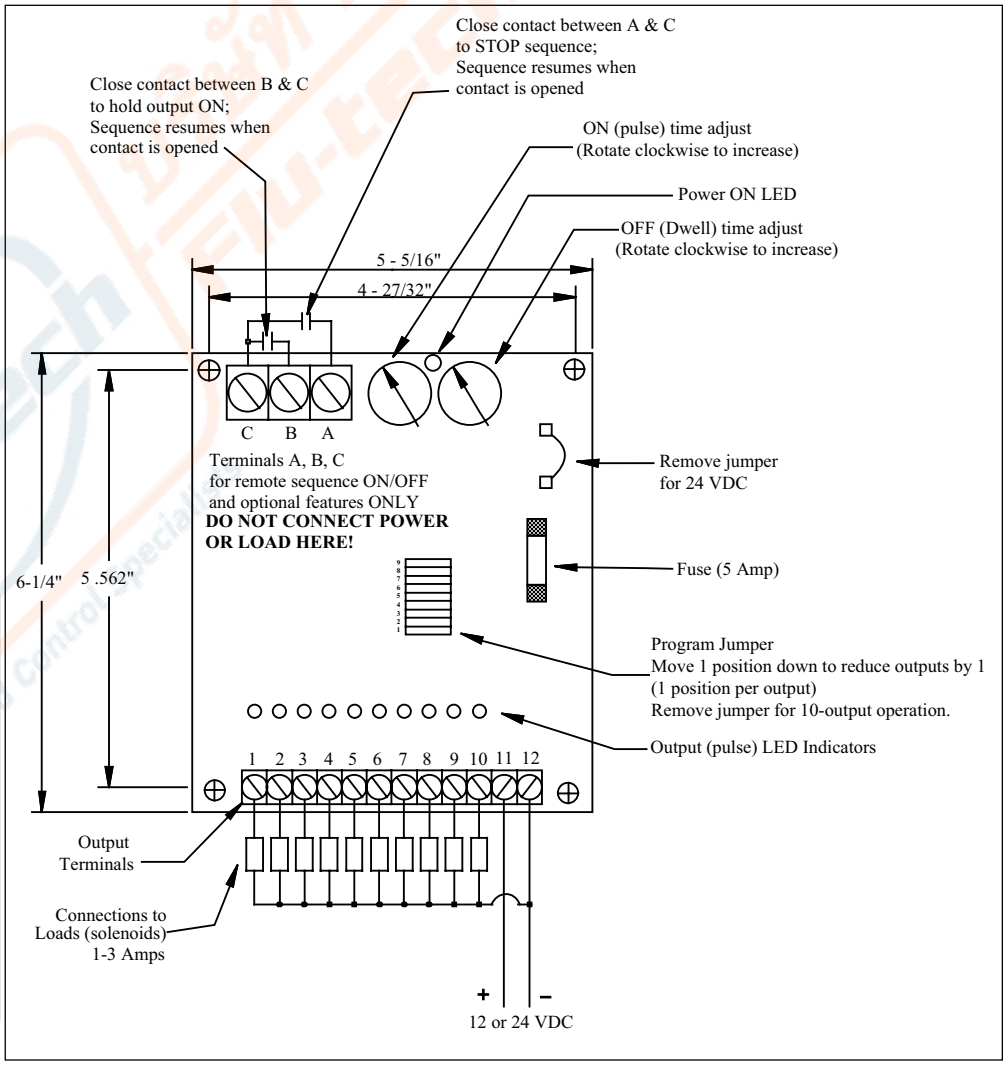
On time range: 30 milliseconds to 1.2 seconds

Off (dwell) time range: 2 seconds to 2 minutes.

**OFF (dwell) time ranges can be extended by inserting 16 VDC capacitor between terminals A and C. Positive (+) lead of capacitor is connected to terminal A, negative (-) lead of capacitor is connected to terminal C.*

16 VDC capacitor values and corresponding time ranges shown in the chart below. Other times available by special order.

Time Range	Value (mfd)
16 to 600 milliseconds	0.1
30 milliseconds to 1.2 seconds	0.2
0.1 to 6 seconds	1.0
0.2 to 12 seconds	2.2
0.3 to 20 seconds	3.3
1 to 60 seconds	10.0
2 seconds to 2 minutes	22.0
15 seconds to 10 minutes	100.0
30 seconds to 20 minutes	220.0
1 to 45 minutes	470.0



Enclosures

For CBO 4 and CBO 10 Controllers

Light gray opaque bases and covers constructed of high-impact, UV resistant polycarbonate.

Rated for IP 66 / NEMA 4X Protection.

Mechanical and Thermal		Test Spec
Instrumental Dart Impact @ 73°F (23°C)	565 in/lb (31.6 m/kg)	
Falling Ball Impact @ 73°F (23°C)	900 in/lb (50.4 m/kg)	UL-746
Deflection Temperature @ 264 psi (18.2 Bar)	270°F (132°C)	ASTM D648
Modulus of Elasticity	340 ksi (2344 mPa)	ASTM D790
Temperature Range	-40° to 265°F (-40°C to 129°C)	
Flammable/UV Ratings		
Flame Rating - UL	5VA	UL 94
Outdoor UV Exposure	F1	UL

Diagram for CBO 4 Enclosure

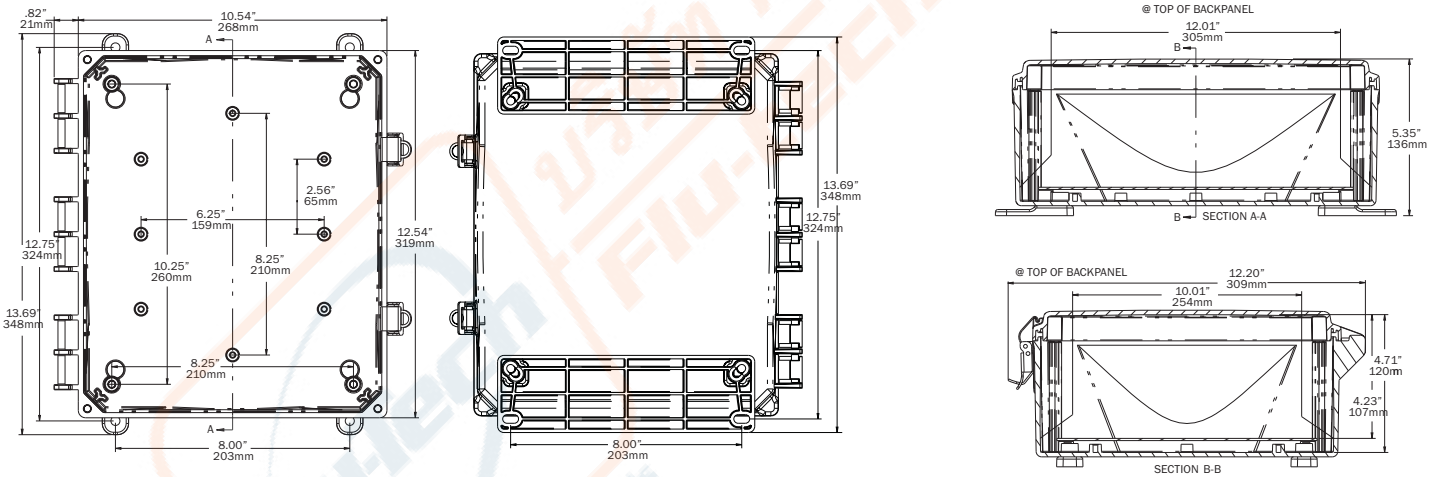
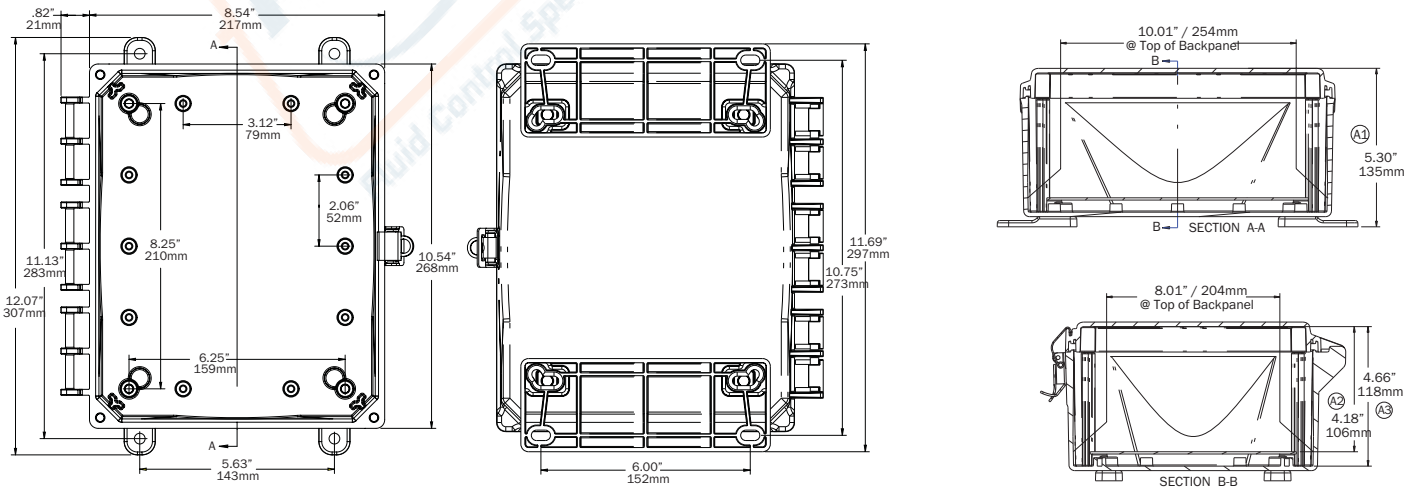


Diagram for CBO 10 Enclosure



Explosion Proof NEMA 7/9 Enclosure

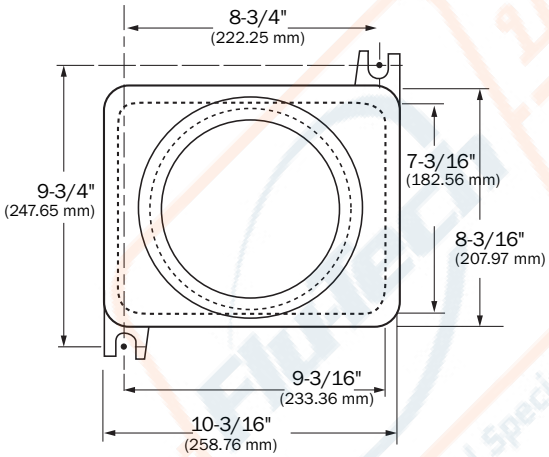
(For CBO 4-7/9-XP & CBO 10-7/9-XP)

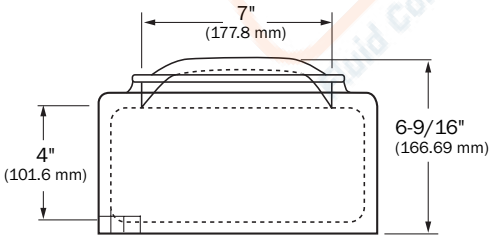
The heavy duty wall sections of these boxes are thick enough to provide the required five (5) threads for the maximum conduit size as indicated.

The boxes are drilled and tapped to specification.

- Rugged sand-cast aluminum, copper-free alloy – 0.3% max. copper content
- Tumblasted for quality appearance
- Cast-on mounting lugs, ease of field installation
- Grounding screw standard
- NEMA 3,4: Features installation of O-ring gasket on cover

Nominal Dimensions							
Model	Conduit Size	Inside Dimensions W	L	D	Cover Opening Dia.	Mounting Hole Size	Weight
XJHAH N4	2	7-3/16" (182.56 mm)	9-3/16" (233.36 mm)	4" (101.6 mm)	7" (177.8 mm)	9/16" (14.29 mm)	16.5 lb (7.48 kg)





Certifications

Class I, Groups B,C,D Class II, Groups E,F,G TYPE 4	UL 1203 CSA C22.2 No. 25 & 30 UL 50

บริษัท ฟลูเทค จำกัด
FLU - TECH CO., TD
845/3-4 หมู่ 3 ถ.เทพารักษ์ ต.เทพารักษ์ อ.เมือง จ.สมุทรปราการ 102070
845/3-4 Thepaharak RD., T. Thepharak, A. Muang, Samutprakan 10270 THAILAND
Tel. 0 2384 6060, Fax 0 2384 5701, Email : sales@flutech.co.th, www.flutech.co.th