

SOLENOID VALVES FOR THE PROCESS CONTROL INDUSTRY

VERSA[®]

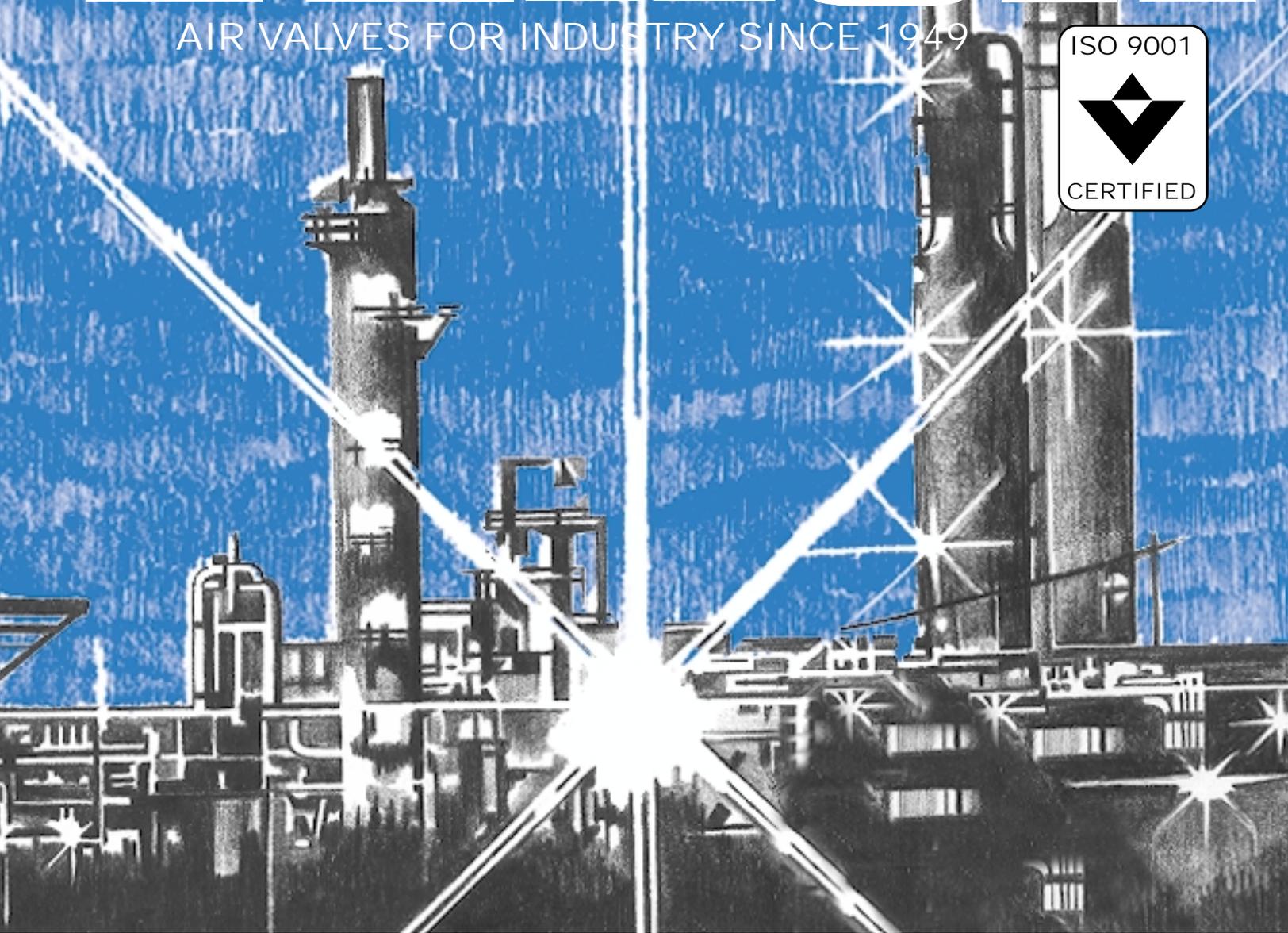
BULLETIN
PCg-2001

AIR VALVES FOR INDUSTRY SINCE 1949

ISO 9001



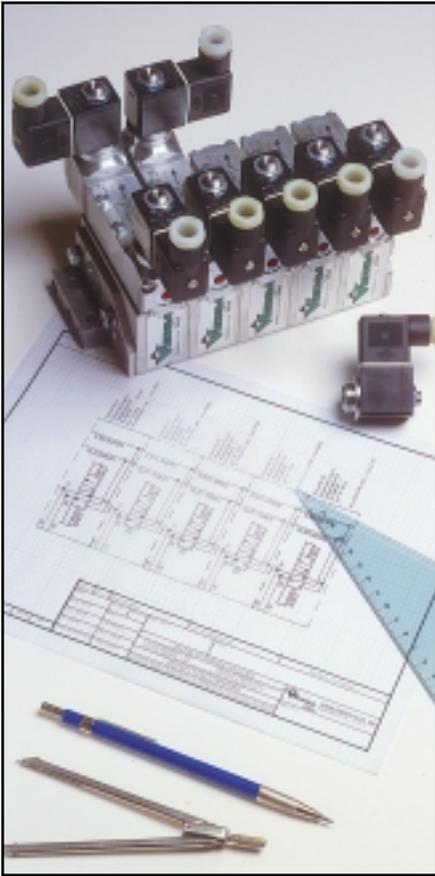
CERTIFIED



www.versa-valves.com

Versa Products Company, Inc., 22 Spring Valley Road, Paramus, New Jersey, USA 07652 • TEL: 201/843-2400 FAX: 201/843-2931
e-mail: sales@versa-valves.com

Versa BV., Halstraat 3, 7321 AG Apeldoorn, The Netherlands • TEL: +31-55-3681900 FAX: +31-55-3681909
e-mail: sales@nl.versa-valves.com



QUALITY IS ABSOLUTE

Quality has no degrees at Versa. There is no such thing as “pretty good” or “almost right”. Every product is designed and manufactured to conform to uniformly high standards. These standards are assured by a quality management system which includes ISO 9001 certification and testing of all products prior to shipment.

No matter how tough the application or environmental demands, Versa offers you a choice of valves to meet the challenge. Advanced design, durable construction materials and rigid manufacturing standards provide valves you can rely on for years of trouble-free performance.

Be it a single valve or a pneumatic system, Versa’s commitment to quality is uncompromising. Count on it.

THE COMMITMENT CONTINUES

Fluid Power is our business. It is our only business, so we have to be good at it. Since its beginning in 1949, Versa has maintained its commitment to quality products and satisfied customers.

Versa has succeeded in serving industry’s needs with a broad line of directional control devices. Our focus on product variety, technical expertise and company support remains constant. It all begins with a responsiveness to industry needs and ends with delivery of *the valve or system you need—when you need it.*

We view ourselves as problem solvers and that role required more than making good products. It is what we do before and after that is equally important. From drawing board to user satisfaction, our commitment is continuous.



HOW WE PUT IT TOGETHER IS WHAT SETS US APART

Versa is not the biggest manufacturer of directional control valves, so we try to be the best.

Design, manufacture, quality control, pricing, delivery—whatever the function—it must be geared to customer needs.

Many companies sell valves. At Versa, that is not enough. We sell satisfaction.

WORLDWIDE ACCESSIBILITY

More than 500 fluid power representatives and over 100 stocking locations comprise Versa’s worldwide distribution system. They are supported by manufacturing and technical centers in the United States and The Netherlands.

The distributor network is the key to customer service and the source of continuous application feedback. Versa uses this input as part of its research and development program in an effort to respond to individual and industry needs.

Versa makes certain that our distributors’ sales and service personnel receive factory training on an ongoing basis. This includes basic theory, product indoctrination and seminars.

Our distributor family is a source of pride to Versa—but more important—it is a source of support and service to all of our customers.

Contact Versa for the distributor servicing your specific area.



Versa exercises diligence to assure that information contained in this catalog is correct, but does not accept responsibility for any errors or omissions. Versa also reserves the right to change or delete data or products at any time without prior notification. To be sure the data you require is correct, consult factory.



CONTENTS GUIDE

Direct Mount Actuator Valves..... Page 4 - 7

- Namur (Series C5) 4-way Page 4, 6 & 7
- Namur (Series E5) 3-way Page 5 - 7

Bodyported Valves Page 8 - 16

- Aluminum (Series C5/C7) 3-way & 4-way Page 8 - 9
- Brass (Series V) 3-way & 4-way Page 10 - 12
- Stainless Steel (Series E & E5) 3-way Page 13
- Stainless Steel (Series V316) 3-way & 4-way .. Page 14 - 16

Lockout Valves:

- Brass (Series V) or Stainless Steel (Series V316);
3-way and 4-way Page 17

Latching/Manual Reset Valves:

- Brass (Series V) or Stainless Steel (Series V316);
3-Way & 4-Way Page 18 - 19

Redundant Valves:

- Brass (Series V) or Stainless Steel (Series V316);
3-way & 4-way Page 20

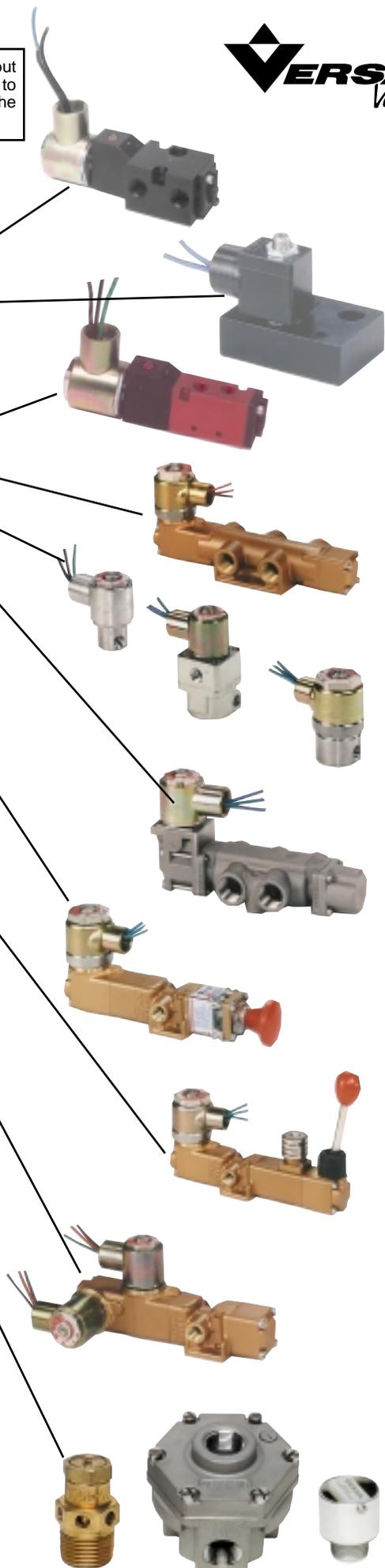
Accessories:

- Bleed Control Valves }
- Dust Excluders } Page 21
- Quick Exhaust Valves }

Technical Information:

- Non-Hazardous Service Solenoids Page 22 - 23
- Hazardous Service Solenoids Page 24 - 25
- Option Availability Page 26 - 27

Warranty..... Page 28



DIRECT MOUNT ACTUATOR VALVES

ALUMINUM CONSTRUCTION

SERIES C5 NAMUR

3-Way/4 Way Field Convertible Solenoid Valves

General Description

The Versa C5 NAMUR mount control valve is a high flow, 5-port, solenoid/pilot valve. It is designed to mount directly to any NAMUR actuator, thus reducing actuator response time and cost of tubing, fittings, brackets, and labor. Many adaptor kits are available for non-NAMUR actuators. Consult factory for kit availability.

The 5-port design allows the C5 NAMUR to be ordered as either 4-way (for double acting actuators) or 3-way (for spring return or fail-safe actuators). The function of this valve is field convertible utilizing no special tools, gaskets, or sealants. Relocation of a port plug converts a 3-way to a 4-way, or a 4-way to a 3-way. When the 4-way valve is converted to 3-way function, the unused exhaust port becomes an actuator vent into which a filter/muffler can be installed to prevent contaminants from entering either the valve or the actuator.

Single solenoid models (for 2-position control), or double solenoid models (for 2 or 3-position control) are available. Actuator positioning is possible with the use of 3-position valves since all Versa C5 NAMUR valves are leakfree/bubbletight. A complete selection of electrical connections, area classifications, and



power requirements makes the most exacting and demanding specifications or applications easy to satisfy. Manual overrides (guarded-push to operate) are standard on all C5 NAMUR valves. Consult factory for other manual overrides available as an option.

Materials

Valve body and plunger: anodized aluminum (for stainless steel direct mount valve, consult factory)

Actuating Caps: solenoid—anodized aluminum
spring cap—synthetic resin

Valve seals: plunger and body—FKM (fluorocarbon)
pilot piston—NBR (nitrile)

valve/actuator mounting O rings—NBR (nitrile)

Pilot Piston: synthetic resin

Screws: stainless steel (except valve to actuator = carbon steel)

Port plug: brass

Solenoid parts: sleeve, plunger & spring—304 & 430F stainless steel

coils—epoxy encapsulated with 3 spade terminals (std) or 2 or 3 wire lead (opt)

coil cover— (when applicable) option:—C50 = carbon steel, painted;

—LB—XN, —LB—XX, —PC, —PC—XN, —PC—XX, —XN, —XX= carbon steel, zinc chromate plated

Operating Pressures and Weights

Valve Type	Operating Pressure Range ^{††} Pneumatic	Approximate Weights	
		Ordinary Service	Hazardous Service
Single Solenoid/spring return (2-position)	15-115 psi (1-8 bar)	0.8 lbs. (363 g)	1.1 lbs. (500 g)
Double Solenoid/detented (2-position)	10-115 psi (0.7-8 bar)	1.2 lbs. (545 g)	1.8 lbs. (816 g)
Double Solenoid/spring centered (3-position)	15-115 psi (1-8 bar)	1.2 lbs. (545 g)	1.8 lbs. (816 g)

†† Pressure ranges may change based on solenoid option.

See page 6.

MPa = $\frac{\text{bar}}{10}$

For higher pressure applications, consult factory.

Porting Size

Inlet and exhaust — 1/4 NPT or G1/4

Cylinder ports — O ring seal per NAMUR standard (For non-NAMUR actuators, consult factory)

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation.

40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended.

Ambient temperature range 5°F (15°C) to 125°F (50°C).

Flow Rates

Cv = 0.75 (Kv = 11) average for all ports (48 SCFM at 100 psi; 82 Nm³/h at 7 bar).

For actuator speed rates see page 6.

Options Suffix

Manual Override: none Standard on basic valves, guarded-push to operate.

All other options see page 6.

C5 NAMUR Valve Product Number Selector

Basic Valve Number*

FUNCTION**	PORT SIZE	Cv (Kv)	SINGLE SOLENOID/SPRING RETURN, 2 POSITION	DOUBLE SOLENOID/DETENT, 2 POSITION	DOUBLE SOLENOID/SPRING CENTERED, 3 POSITION	
					Blocked Center	Exhaust Ports Open
4-way 5/2 & 5/3	1/4 NPT G1/4	.75 (11)	CGS-4232-NB1 -T- (coil code)	CGG-4232-NB1 -T- (coil code)	CXX-4233-NB1 -T- (coil code)	CXX-4234-NB1 -T- (coil code)
		.75 (11)	CGS-4292-NB1 -T- (coil code)	CGG-4292-NB1 -T- (coil code)	CXX-4293-NB1 -T- (coil code)	CXX-4294-NB1 -T- (coil code)
3-way** 3/2 & 3/3	1/4 NPT G1/4	.75 (11)	CGS-3232-NB1 -T- (coil code)	CGG-3232-NB1 -T- (coil code)	CXX-3233-NB1 -T- (coil code)	CXX-3234-NB1 -T- (coil code)
		.75 (11)	CGS-3292-NB1 -T- (coil code)	CGG-3292-NB1 -T- (coil code)	CXX-3293-NB1 -T- (coil code)	CXX-3294-NB1 -T- (coil code)

* All valves include O ring interface seals and #10-24 mounting screws.

For #10-32 screws change NB1 to NB2. For M5 screws change NB1 to NB3.

** 3-way is the same valve as 4-way, but is provided with a relocated cylinder port plug. See note on page 7

For coil code see page 6.
† Add suffix option here, if required.

SERIES E5 NAMUR

3-Way Solenoid Valves

General Description

The Versa E5 NAMUR mount control valve is an inexpensive, simple and effective 3-way direct-acting solenoid valve. It is designed to mount directly to any NAMUR actuator thus reducing cost of tubing, fittings, brackets and labor.

It is most effective on spring return or fail-safe actuators where high speed open or close is not important, but where cost is a factor. A threaded actuator vent port is standard.

Available as a 3-way, 2-position, direct solenoid, spring return only, and with most of the Versa solenoid options. See page 6.

Materials

Valve body: anodized aluminum
 Valve seals: body/plunger — NBR (nitrile)
 valve/actuator mounting O rings — NBR (nitrile)

Screws: (valve to actuator) = carbon steel

Solenoid parts: sleeve, plunger & spring— 304 & 430F stainless steel
 coils—epoxy encapsulated with 3 spade terminals (std) or 2 or 3 wire lead (opt)
 coil cover— (when applicable) option:—C50 = carbon steel, painted;
 —LB—XN, —LB—XX, —PC, —PC—XN, —PC—XX, —XN, —XX= carbon steel, zinc chromate plated

Operating Pressures and Weights

Valve Type	Operating Pressure Range Pneumatic	Approximate Weights	
		Ordinary Service	Hazardous Service
Single Solenoid/spring return (2-position)	0-150 psi (0-10.3 bar)	0.6 lbs. (272 g)	0.9 lbs. (408 g)

Porting Size

Inlet and Vent -1/4 NPT or G1/4
 Exhaust -#10-32 (1/8 NPT or G1/8 available)
 Cylinder ports -O ring seal for NAMUR standard (For non-NAMUR actuators, consult factory)

Installation, Filtration and Lubrication

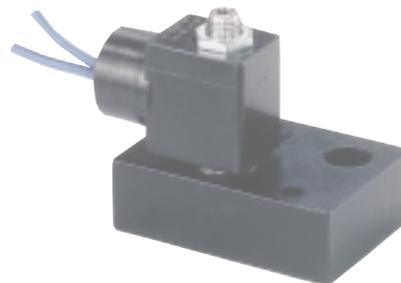
Valves have no limitations on mounting orientation. 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended. Ambient temperature range 5°F (15°C) to 125°F (50°C).

Flow Rates

Cv = 0.08 (Kv = 1.2) average for all ports
 (5 SCFM at 100 psi; 8.5 Nm³/h at 7 bar).
 For actuator speed rates see page 6.

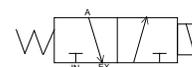
Options

See page 6.



E5 NAMUR Valve Product Number Selector

			Basic Valve Number*	
FUNCTION	PORT SIZE	Cv (Kv)	SINGLE SOLENOID/SPRING RETURN 2-POSITION	
3-way	1/4 NPT	.08 (1.2)	E5SM-3011-34-NB1 -† (coil code)	
3/2	G1/4	.08 (1.2)	E5SM-3071-34-NB1 -† (coil code)	



For coil code see page 6.
 †Add suffix option here, if required.

* All valves include O ring interface seals and #10-24 mounting screws.
 For #10-32 screws change NB1 to NB2.
 For M5 screws change NB1 to NB3.

DIRECT MOUNT ACTUATOR VALVES

NAMUR Solenoid Options

NAMUR OPTIONS		VOLTAGES & COIL CODES**			NOMINAL COIL POWER
		VALVE TYPE		E5	
DESCRIPTION		SUFFIX DETAIL*	C5		E5
NON-HAZARDOUS SERVICE	Spade Terminals (standard)	None			AC=8.5 W DC=10.5 W
	Strain Relief mini-DIN type connector, cord grip PG9	-HC			
	1/2 NPT conduit mini-DIN type connector	-HCC	24V60 (A024)	12VDC (D012)	
	1/2 NPT conduit, watertight, NEMA 4	-228L	110V50 (E110) 120V60 (A120)	24VDC (D024)	
1/2 NPT conduit, general purpose, NEMA 1,2,3	-C50	220V50 (E220) 240V60 (A240)	48VDC (D048)	AC=6 W DC=7 W	
1/2 NPT conduit, watertight, NEMA 4 & 4X	-PC	240V50 (E240)			
HAZARDOUS SERVICE	Flameproof, 1/2 NPT conduit, NEMA 7 & 9, UL listed, CSA approved	-XX	24V60 (A024)	12VDC (D012)	AC=5.6 W DC=7.2 W
	-watertight, dusttight, NEMA 4, 4X, 7 & 9, UL listed, CSA approved	-PC-XX	110V50 (E110), 120V60 (A120)	24VDC (D024)	
	Flameproof, M20x1.5 conduit, Zone 1 & 2 ISSeP approved per CENELEC, IP66	-XN	220V50 (E220), 240V60 (A240)	48VDC (D048)	
	Flameproof, low power, 1/2 NPT conduit, NEMA 7 & 9, UL listed	-LB-XX	12V60 (A012)	6VDC (D006)	AC or DC =1.8 W
	Flameproof, low power, M20x1.5 conduit, Zone 1 & 2 ISSeP approved per CENELEC, IP66	-LB-XN	24V60 (A024)	12VDC (D012)	
			48V60 (A048)	24VDC (D024)	
Intrinsically safe, strain relief mini-DIN type connector, cord grip PG 9	-XISP	24VDC (D024)	not available	DC=1.6 W max	
-Factory Mutual/CSA approved -PTB approved per CENELEC		system voltage prior to barrier			

* Add option number to basic valve number as suffix. See pages 22/23, 24/25 and 26/27 for complete description.

** The coil code is shown within the parenthesis following the voltage. Add desired coil code to end of valve number.

Actuator Speed Chart

This chart represents approximate actuator operation times under average load conditions at 80 psi (5.5 bar). Due to differing designs of quarter-turn actuators, breakaway friction, loading, internal airflow, inlet piping, fittings and exhaust port options, the values shown are intended as an estimate. Faster or slower times may actually be achieved.

		ACTUATOR VOLUME in ³ (cm ³)									
		Valve Type	5 (82)	10 (164)	25 (410)	50 (820)	100 (1640)	150 (2460)	200 (3280)	400 (6560)	600 (9840)
ACTUATOR CYCLE TIME IN SECONDS	C5	.32	.36	.47	.63	.98	1.3	1.7	3.1	4.5	7.2
	E5	.46	.64	1.1	2.0	3.9	5.7	7.5	--	--	--

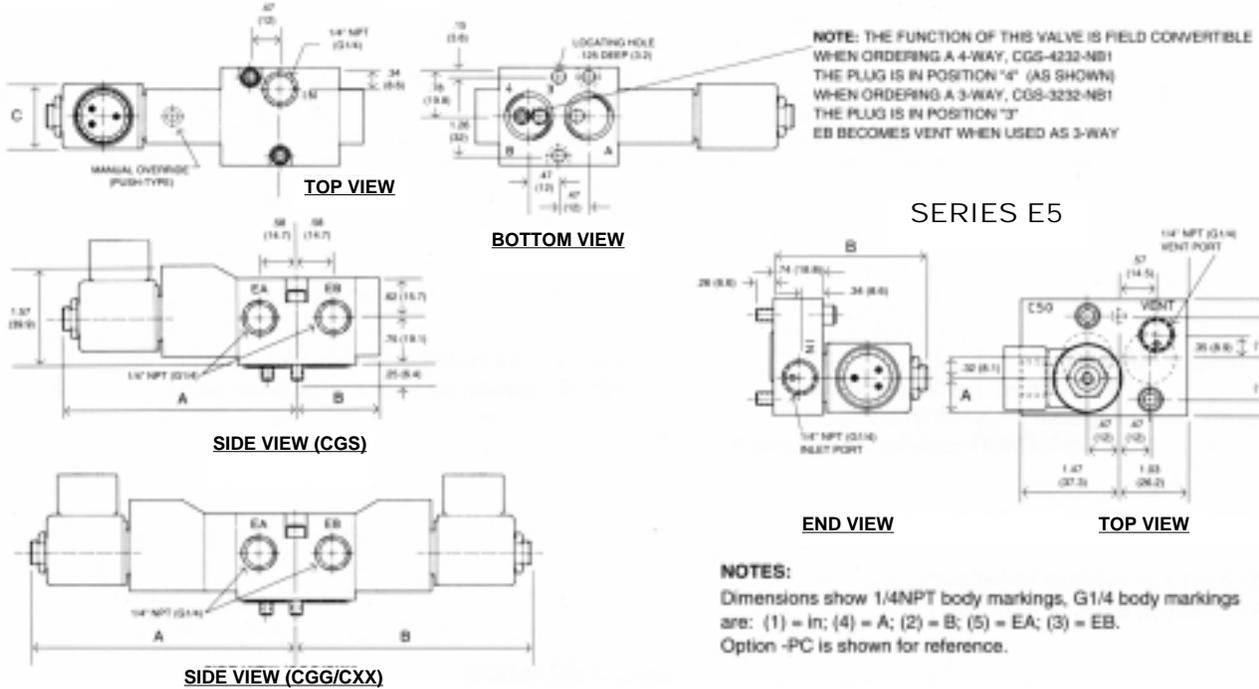
For double-acting actuators (open & close), use volumes from selected actuator specifications and the chart for estimated speed. The times indicated are per shift. For spring return actuators, use open volume to obtain time

from chart. Actuator spring loading may affect shift time. Slower speeds (adjustable) can always be accomplished by using Versa's Bleed Control Valves in the control valve exhaust port (see page 21).

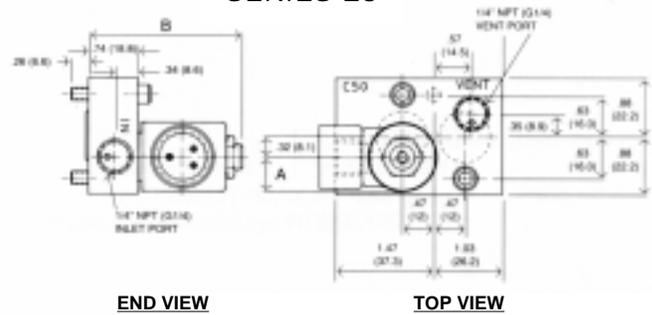
NAMUR Dimensions Shown as inch (mm)

Port markings shown are for valves with NPT threads. Port markings for valves with G threads are: (1) = IN; (2) = B; (3) = EB; (4) = A; (5) = EA. Option -PC is shown for reference.

SERIES C5



SERIES E5



NOTES:
Dimensions show 1/4NPT body markings, G1/4 body markings are: (1) = IN; (4) = A; (2) = B; (5) = EA; (3) = EB.
Option -PC is shown for reference.

NAMUR DIMENSIONS:		INCHES (mm)					
Valve Type	Solenoid Option						
	STANDARD, -228L		-C50, -PC		-XX, -XN		
	A	B	A	B	A	B	
E5	.44 (11.2)	2.31 (58.7)	.52 (13.2)	2.31 (58.7)	.73 (18.4)	2.39 (60.7)	

NAMUR DIMENSIONS:		INCHES (mm)														
Valve Type	Solenoid Option															
	Standard, -228L			-027, -043			-C50, -PC			-XX, -XN			-XISP			
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	
CGS	3.71 (94.2)	1.31 (33.3)	.885 (22.5)	3.45 (87.6)	1.31 (33.3)	.875 (22.2)	3.71 (94.2)	1.31 (33.3)	1.04 (26.4)	3.79 (96.3)	1.31 (33.3)	1.45 (36.8)	3.53 (89.7)	1.31 (33.3)	1.15 (29.2)	
CGG/CXX	4.21 (106.9)	3.71 (94.2)	.885 (22.5)	3.96 (100.6)	3.45 (87.6)	.875 (22.2)	4.21 (106.9)	3.71 (94.2)	1.04 (26.4)	4.29 (109.0)	3.79 (96.3)	1.45 (36.8)	4.03 (102.4)	3.53 (89.7)	1.15 (29.2)	

BODYPORTED VALVES

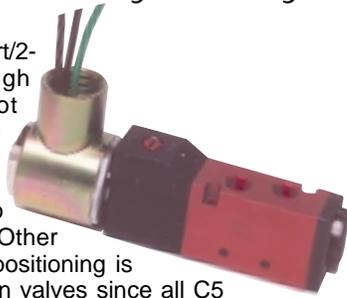
ALUMINUM CONSTRUCTION

SERIES C5/C7 Bodyported 3-Way*/4-Way Solenoid Valves

General Description

Versa C5 and C7 valves are 5 port/2-position or 5 port/3-position, high flow, bodyported, solenoid/pilot valves. They can be provided with single solenoid or double solenoid actuators. Manual override (guarded-push to operate, turn to lock) is standard on all models. Other options are available. Actuator positioning is possible with the use of 3-position valves since all C5 and C7 valves are leakfree/bubbletight.

The Basic valve is supplied with DIN style coil, but other options are available making the most exacting and demanding specifications or applications easy to satisfy.



Materials

Valve body and plunger: anodized aluminum
 Actuating Caps: solenoid— anodized aluminum
 spring cap—synthetic resin
 Pilot Piston: synthetic resin
 Valve seals: plunger and body— FKM (fluorocarbon)
 pilot piston— NBR (nitrile)
 Screws: stainless steel
 Solenoid parts: sleeve, plunger & spring— 304 & 430F stainless steel
 coils—epoxy molded with 3 spade terminals (std) or 2 or 3 wire leads (opt)
 coil cover (opt.-when applicable)—zinc chromate coated steel

Valve Type	Size Series	Operating Pressure Range [†] Pneumatic	Approximate Weights	
			Ordinary Service	Hazardous Service
Single Solenoid/spring return (2-position)	C5	15-115 psi (1-8 bar)	0.5 lbs. (235 g)	0.8 lbs. (363 g)
	C7	25-115 psi (1.7-8 bar)	0.7 lbs. (300 g)	1.0 lbs. (454 g)
Double Solenoid/detented (2-position)	C5	10-115 psi (0.7-8 bar)	0.87 lbs. (395 g)	1.2 lbs. (545 g)
	C7	15-115 psi (1-8 bar)	1.0 lbs. (454 g)	1.3 lbs. (590 g)
Double Solenoid/spring centered (3-position)	C5	15-115 psi (1-8 bar)	0.87 lbs. (395 g)	1.2 lbs. (545 g)
	C7	25-115 psi (1.7-8 bar)	1.0 lbs. (454 g)	1.3 lbs. (590 g)

† Pressure ranges may change based on solenoid option. See page 6.
 MPa = $\frac{\text{bar}}{10}$

For higher pressure applications, consult factory.

Porting Size

Inlet, outlet and exhaust — 1/8 NPT or G1/8-Series C5
 1/4 NPT or G1/4-Series C7

Flow Rates (average for all ports)

Cv = 0.75 (Kv = 11) for 1/8 NPT (G1/8)-Series C5
 Cv = 1.6 (Kv = 23) for 1/4 NPT (G1/4)-Series C7

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation.
 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended.
 Ambient temperature range 5°F (15°C) to 125°F (50°C).

Options Suffix

Manual Override: none Standard on basic valves,
 guarded-push to operate, turn to lock
 -CML unguarded-push to operate, twist to lock
 All other options see page 6 (same options utilized as Direct Mount Valves).

C5/C7 Bodyported Valve Product Number Selector

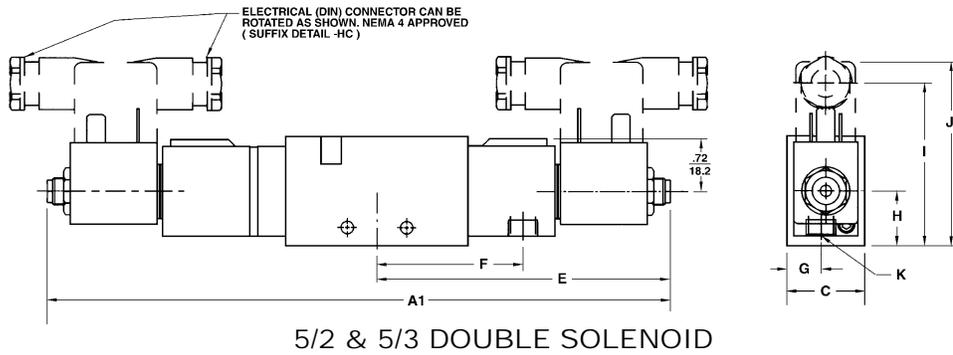
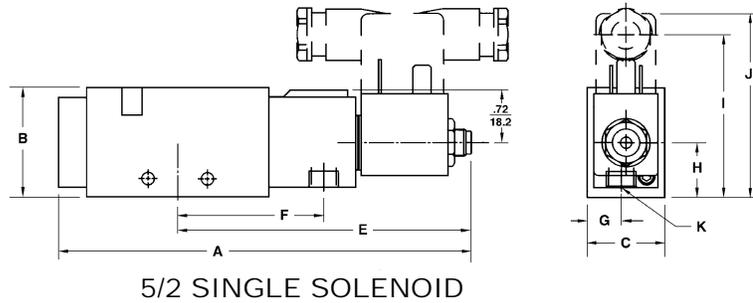
For coil code see page 6.

FUNCTION*	SIZE SERIES	PORT SIZE	Cv (Kv)	Basic Valve Number			
				SINGLE SOLENOID/SPRING RETURN, 2 POSITION	DOUBLE SOLENOID/DETENT, 2 POSITION	DOUBLE SOLENOID/SPRING CENTERED, 3 POSITION	
						Blocked Center	Exhaust Ports Open
4-WAY 5/2 & 5/3	C5	1/8 NPT G1/8	0.75 (11)				
			0.75 (11)	CSG-4222-†-(coil code)	CGG-4222-†-(coil code)	CXX-4223-†-(coil code)	CXX-4224-†-(coil code)
	C7	1/4 NPT G1/4	1.6 (23)				
			1.6 (23)	CSG-4322-†-(coil code)	CGG-4322-†-(coil code)	CXX-4323-†-(coil code)	CXX-4324-†-(coil code)
				CSG-4382-†-(coil code)	CGG-4382-†-(coil code)	CXX-4383-†-(coil code)	CXX-4384-†-(coil code)

* 3-Way valve can be obtained by plugging one port of a 4-way. For 3-way NC plug port B (4); for 3-way NO plug port A (2).

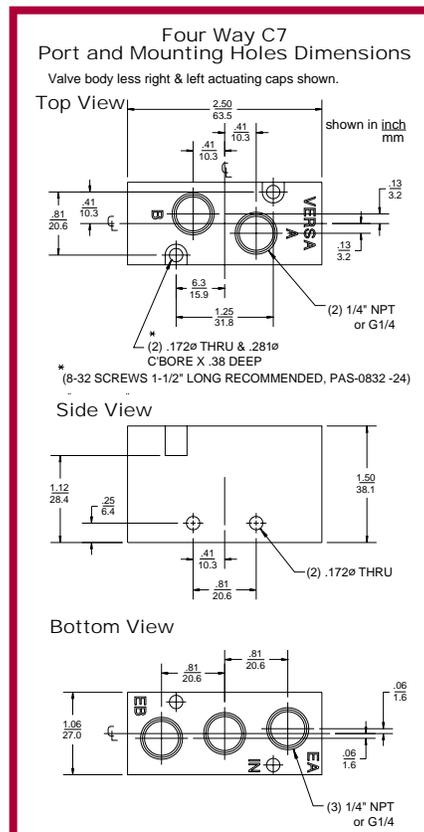
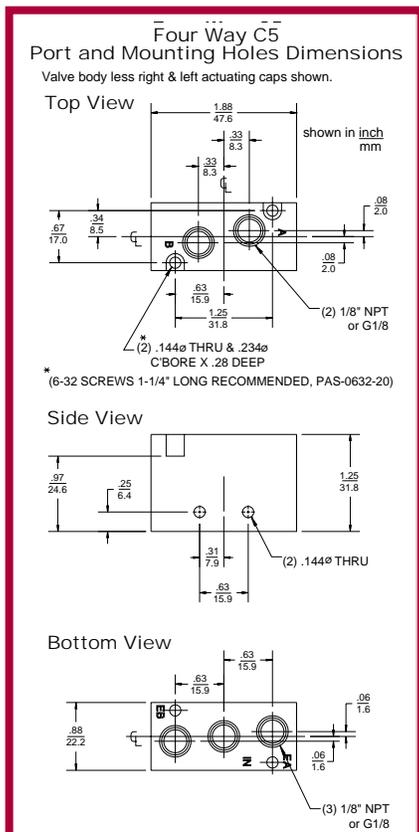
† Add suffix here, if required.

Bodyported Series C5 & C7 Dimensions



Basic Valve Dimensions

		A	A1	B	C	E	F	G	H	J	K	L
C5	inch	5.03	7.92	1.25	0.88	3.71	1.69	0.38	0.63	2.11	1/8 NPT	2.47
	mm	127.7	201.2	31.8	22.4	94.2	42.8	9.5	15.9	53.5	G1/8	62.8
C7	inch	5.65	8.55	1.50	1.06	4.02	2.00	0.47	0.75	2.23	1/4 NPT	2.53
	mm	143.6	217.1	38.1	27.0	102.2	50.8	11.8	19.1	56.7	G1/4	64.2



NOTE: VALVES SUPPLIED WITH G THREADS HAVE PORTS MARKED AS FOLLOWS: IN=1, A=2, EA=3, B=4, EB=5

BODYPORTED VALVES

BRASS CONSTRUCTION

SERIES V Bodyported 3-Way & 4-Way Solenoid Valves

General Description



Versa Series V valves are full flow port valves, available in 1/8, 1/4, 3/8, 1/2, 3/4 and 1" NPT port sizes. Ports of 1/8 to 1/2 ISO 228 "G" threads are also available. Three-way designs are provided with 3 ports; four-way designs have 5 ports. Each is available for 2-position or

3-position service. Standard size O ring seals provide leak-free/bubbletight sealing and ease of repair, if necessary.

Each valve is solenoid/pilot actuated, which enables the use of physically small solenoids and resultant low power consumption, and also assures a large positive shifting force without fear of coil burn-out. A complete selection of electrical connec-

tions, area classifications, and power requirements makes the most exacting and demanding specifications or applications easy to satisfy.

Materials

- Valve body: forged brass
- Actuating Caps: solenoid—forged brass
spring cap—diecast aluminum
- Internal parts (wetted): rod brass
- Valve seals: NBR (nitrile), standard size O rings
- Screws: zinc plated steel
- Solenoid parts: sleeve, plunger & spring— 304 & 430F and 302 stainless steel
coils—epoxy molded with 2 or 3 wire leads (Std.)
coil cover (Std)—zinc chromate coated steel

Operating Pressures and Weights

Valve Type	Port Size	Operating Pressure Range [†] Pneumatic	Approximate Weights							
			Ordinary Service				Hazardous Service ^{††}			
			3-way		4-way		3-way		4-way	
			lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
Single Solenoid/spring return (2-position)	1/8 or 1/4	40-175 psi (2.8-12 bar)	3.5	1.6	4.1	1.9	3.9	1.8	4.5	2.0
	3/8 or 1/2		5.3	2.4	6.6	3.0	5.7	2.6	7.0	3.2
Double Solenoid/momentary contact (2-position)	3/4 or 1	50-175 psi (3.5-12 bar)	11.3	5.1	15.0	6.8	11.7	5.3	15.4	7.0
	1/8 or 1/4	20-175 psi (1.4-12 bar)	4.9	2.2	5.5	2.5	5.8	2.6	6.3	2.9
3/8 or 1/2	6.7		3.1	8.1	3.7	7.6	3.5	8.9	4.0	
Double Solenoid/spring centered (3-position)	3/4 or 1	13.7	6.2	17.4	8.0	14.6	6.6	18.2	8.3	
	1/8 or 1/4	40-175 psi (2.8-12 bar)	5.8	2.7	6.3	2.9	6.7	3.1	7.1	3.2
	3/8 or 1/2		7.6	5.0	8.9	4.0	8.5	5.4	9.7	4.4
	3/4 or 1	50-175 psi (3.5-12 bar)	17.5	7.9	21.2	9.6	18.3	8.3	22.0	10.0

† Pressure ranges may change based on solenoid option. See page 23/25. MPa = $\frac{\text{bar}}{10}$

†† Weights shown for hazardous service are for type -XX. For other suffix options consult factory.

Porting Size

Inlet, outlet and exhaust — 1/8" NPT, 1/4" NPT, 3/8" NPT, 1/2" NPT, 3/4" NPT, or 1" NPT. Or G1/8, G1/4, G3/8, G1/2 ISO 228.

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation. 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended. Ambient temperature range -10°F (-23°C) to 200°F (95°C).

Flow Rates

Port Size	Average		Flow*	
	C _v Factor (all ports)	K _v Factor (all ports)	SCFM	Nm ³ /h
1/8" NPT or G1/8	1.4	20.3	80	145
1/4" NPT or G1/4	1.8	26.1	100	185
3/8" NPT or G3/8	3.4	49.3	200	345
1/2" NPT or G1/2	4.0	58.0	240	405
3/4" NPT	9.7	140.6	580	980
1" NPT	11.1	161.0	640	1125

* Assumptions:

Flow = air
Inlet pressure = 100 psi (7 bar)
ΔP = 40 psi (3 bar)
Outlet abs = 74.7 psi (5 bar)
Temp = 68°F (20°C)
SG = 1.0

Series V Bodyported Valve Product Number Selector

BASIC VALVE NUMBER

Function	Port Size (NPT)*	Flow		Single Solenoid/Spring Return 2-position	Double Solenoid/Momentary Contact 2-position	Double Solenoid/Spring Centered 3-position	
		Cv	(Kv)			Blocked Center	Exhaust Ports Open
3-way, 3/2 Normally Closed	1/8"	1.4	(20.3)	VSG-3221-U-(coil code)	VGG-3221-U-(coil code)	VXX-3223-U-(coil code)	-----
	1/4"	1.8	(26.1)	VSG-3321-U-(coil code)	VGG-3321-U-(coil code)	VXX-3323-U-(coil code)	
	3/8"	3.4	(49.3)	VSG-3421-U-(coil code)	VGG-3421-U-(coil code)	VXX-3423-U-(coil code)	
	1/2"	4.0	(58.0)	VSG-3521-U-(coil code)	VGG-3521-U-(coil code)	VXX-3523-U-(coil code)	
	3/4"	9.7	(140.6)	VSG-3621-U-(coil code)	VGG-3621-U-(coil code)	VXX-3623-U-(coil code)	
3-way, 3/3 Three Position	1"	11.1	(161.0)	VSG-3721-U-(coil code)	VGG-3721-U-(coil code)	VXX-3723-U-(coil code)	
3-way, 3/2 Normally Open	1/8"	1.4	(20.3)	VGS-3222-U-(coil code)	SEE ABOVE	SEE ABOVE	-----
	1/4"	1.8	(26.1)	VGS-3322-U-(coil code)			
	3/8"	3.4	(49.3)	VGS-3422-U-(coil code)			
	1/2"	4.0	(58.0)	VGS-3522-U-(coil code)			
	3/4"	9.7	(140.6)	VGS-3622-U-(coil code)			
3-way, 3/3 Three Position	1"	11.1	(161.0)	VGS-3722-U-(coil code)			
4-way, 5/2 & 5/3	1/8"	1.4	(20.3)	VSG-4222-U-(coil code)	VGG-4222-U-(coil code)	VXX-4223-U-(coil code)	VXX-4224-U-(coil code)
	1/4"	1.8	(26.1)	VSG-4322-U-(coil code)	VGG-4322-U-(coil code)	VXX-4323-U-(coil code)	VXX-4324-U-(coil code)
	3/8"	3.4	(49.3)	VSG-4422-U-(coil code)	VGG-4422-U-(coil code)	VXX-4423-U-(coil code)	VXX-4424-U-(coil code)
	1/2"	4.0	(58.0)	VSG-4522-U-(coil code)	VGG-4522-U-(coil code)	VXX-4523-U-(coil code)	VXX-4524-U-(coil code)
	3/4"	9.7	(140.6)	VSG-4622-U-(coil code)	VGG-4622-U-(coil code)	VXX-4623-U-(coil code)	VXX-4624-U-(coil code)
4-way, 5/2 & 5/3	1"	11.1	(161.0)	VSG-4722-U-(coil code)	VGG-4722-U-(coil code)	VXX-4723-U-(coil code)	VXX-4724-U-(coil code)

For coil code see page 23 for ordinary location or page 25 for hazardous location.

* Valves with ISO 228 "G" threads have same Cv (Kv) flow factors as corresponding NPT port sizes. To indicate model number of valves with "G" thread, add suffix "-2B" to basic valve number shown. For example: VSG-3221-U becomes VSG-3221-U-2B.

SERIES V BODYPORTED SOLENOID OPTIONS

(Consult page number indicated for complete description of desired option.)

Coil & Coil Housing - nonhazardous location

Suffix

- none: Std coil & housing, (page 26)
- HT: Class H coil, (page 27)
- HC or -HCC: DIN style coil & connector, (page 26)
- PC: Potted coil, (page 26)

Manual Override

Suffix

- G, -M or -M5R: (page 27)

Seals

Suffix

- 11: High nitrile resilient seals, (page 27)
- 155: FKM (fluorocarbon), (page 27)

Solenoid Operator - nonhazardous location

Suffix

- none: Std coil & housing, (page 22/23)
- HC or -HCC: DIN style coil and connector, (page 22/23)

Solenoid Operator - hazardous location

Suffix

- 3567: Low power (1.8 W) operator, (page 24/25)
 - XX
 - XN
 - XDAS, T
 - XIFA, E, or F
 - XISP
 - XMAA, E, F, G
 - XMFA, E, F, G
- } (page 24/25)

Voltage (coil code) - Nonhazardous location operators - (page 22/23)

Hazardous location operators - (page 24/25)

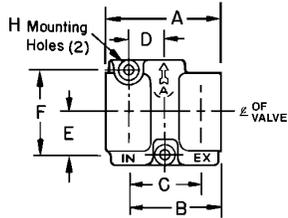
For other coil voltages consult factory.

BODYPORTED VALVES

BRASS CONSTRUCTION

BODYPORTED SERIES V Dimensions†

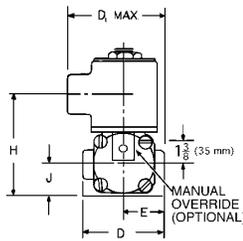
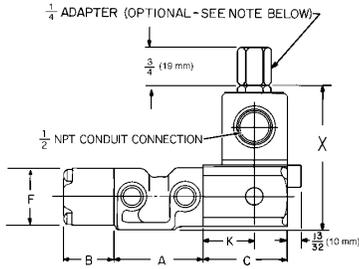
THREE-WAY



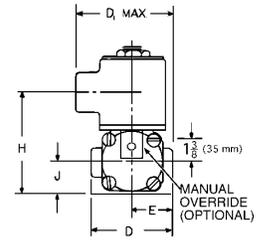
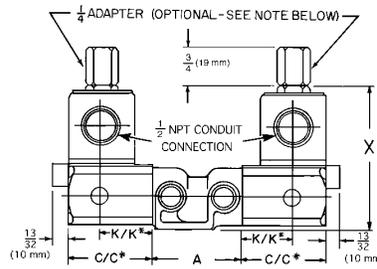
BODY DETAIL

Basic Valve Dimensions	A		B		C		D		E		F		HØ	
	NPT or G	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm
1/8 -1/4	2 ³ / ₁₆	56	1 ³ / ₄	44	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5
3/8 -1/2	3 ³ / ₈	95	2 ⁷ / ₈	73	2	51	1	25	1 ¹ / ₈	29	2 ¹ / ₄	57	.328	8
3/4 -1	5 ¹ / ₂	140	4 ¹ / ₄	108	3	76	1 ¹ / ₂	38	1 ⁹ / ₁₆	40	3 ³ / ₈	79	.390	10

SINGLE SOLENOID



DOUBLE SOLENOID

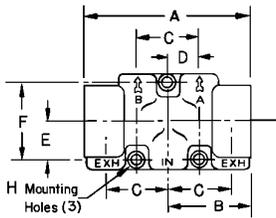


Basic Valve Dimensions

NPT or G	A		B		C		C*		D1		D		E		F		H		J		K		K*		X	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8 -1/4	2 ³ / ₁₆	56	1 ⁷ / ₃₂	31	2 ³ / ₃₂	53	3	76	2 ¹ / ₂	64	2	51	1	25	1 ¹ / ₂	38	2 ¹⁹ / ₃₂	66	1 ¹³ / ₁₆	21	1 ⁹ / ₃₂	33	2 ³ / ₁₆	56	3 ¹³ / ₁₆	97
3/8 -1/2	3 ³ / ₈	95	1 ⁷ / ₃₂	31	2 ³ / ₃₂	53	3	76	2 ⁵ / ₈	73	2 ¹ / ₄	70	1 ³ / ₈	35	1 ¹¹ / ₁₆	43	2 ²¹ / ₃₂	67	7/8	22	1 ⁹ / ₃₂	33	2 ³ / ₁₆	56	3 ⁷ / ₈	98
3/4 -1	5 ¹ / ₂	140	2 ¹ / ₁₆	52	2	51	3 ¹⁵ / ₃₂	88	3 ³ / ₈	86	3 ³ / ₄	95	1 ⁷ / ₈	48	2 ⁷ / ₁₆	62	3 ²⁹ / ₃₂	99	1 ¹ / ₄	32	1	25	2 ¹ / ₂	64	5 ⁵ / ₃₂	131

*Dimensions for Spring-Centering Valves. NOTE: Adapter is supplied when specified by adding suffix "-H" to product number.

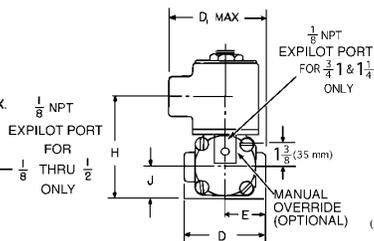
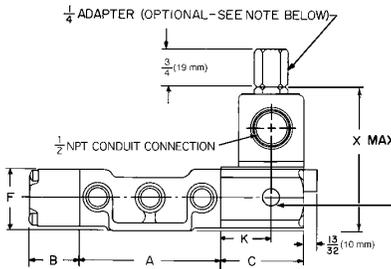
FOUR-WAY



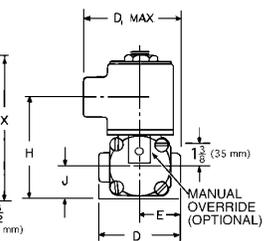
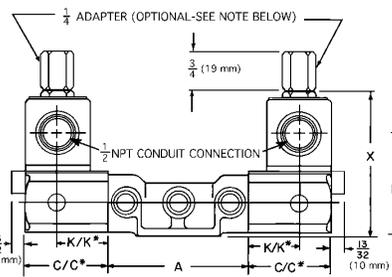
BODY DETAIL

Basic Valve Dimensions	A		B		C		D		E		F		HØ	
	NPT or G	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm	in mm
1/8 -1/4	3 ¹ / ₂	89	1 ³ / ₄	44	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5
3/8 -1/2	5 ³ / ₈	146	2 ⁵ / ₈	73	2	51	1	25	1 ¹ / ₈	29	2 ¹ / ₄	57	.328	8
3/4 -1	8 ¹ / ₂	216	4 ¹ / ₄	108	3	76	1 ¹ / ₂	38	1 ⁹ / ₁₆	40	3 ³ / ₈	79	.390	10

SINGLE SOLENOID



DOUBLE SOLENOID



Basic Valve Dimensions

NPT or G	A		B		C		C*		D1		D		E		F		H		J		K		K*		X	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/8 -1/4	3 ¹ / ₂	89	1 ⁷ / ₃₂	31	2 ³ / ₃₂	53	3	76	2 ¹ / ₂	64	2	51	1	25	1 ¹ / ₂	38	2 ¹⁹ / ₃₂	66	1 ¹³ / ₁₆	21	1 ⁹ / ₃₂	33	2 ³ / ₁₆	56	3 ¹³ / ₁₆	97
3/8 -1/2	5 ³ / ₈	146	1 ⁷ / ₃₂	31	2 ³ / ₃₂	53	3	76	2 ⁷ / ₈	73	2 ³ / ₄	70	1 ³ / ₈	35	1 ¹¹ / ₁₆	43	2 ²¹ / ₃₂	67	7/8	22	1 ⁹ / ₃₂	33	2 ³ / ₁₆	56	3 ⁷ / ₈	98
3/4 -1	8 ¹ / ₂	216	2 ¹ / ₁₆	52	2	51	3 ¹⁵ / ₃₂	88	3 ³ / ₈	86	3 ³ / ₄	95	1 ⁷ / ₈	48	2 ⁷ / ₁₆	62	3 ²⁹ / ₃₂	99	1 ¹ / ₄	32	1	25	2 ¹ / ₂	64	5 ⁵ / ₃₂	131

*Dimensions for Spring-Centering Valves. NOTE: Adapter is supplied when specified by adding suffix "-H" to product number.

†Dimensions shown are for basic valve as listed on previous page. Some options may change the dimensions, for which consult factory.

3-WAY DIRECT SOLENOID VALVES

General Description

Two valve series, Series E and Series E5, comprise the direct actuated, 3 port/2 position valves. The only difference between the two series is physical size and weight, Series E being the greater of the two. Both series offer high reliability at low cost. Stainless steel construction provides the compatibility for use with many aggressive media and environments.

A variation of the valve type provides electrical quick exhaust valves. These valves function the same as a 3-way valve, but a larger capacity exhaust and rapid response to slight pressure differential during the de-energized portion of the cycle, results in a more rapid evacuation of the controlled device than would be expected with a standard 3-way valve.

Materials

Valve body: 430F stainless steel
 Valve seals: Nitrile (Buna N)
 Solenoid parts: sleeve, plunger & spring— 304, 430F and 302 stainless steel
 coils—epoxy molded
 coil cover (when applicable)—zinc chromate coated steel

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation.
 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended.
 Ambient temperature range 0°F (-18°C) to 180°F (82°C).

3-WAY DIRECT SOLENOID VALVE PRODUCT NUMBER SELECTOR

BASIC VALVE NUMBER Single Solenoid/Spring Return, 2-position

Function	Maximum Operating Pressure Differential†	Series E		Series E5	Flow Cv (Kv)	
		1/8" NPT	1/4" NPT	1/8" NPT	Inlet	Exhaust
3-Way, 3/2 Normally Closed Exhaust to Atmosphere (For Piped Exhaust add -H2 to valve number)	150 psi (10.0 bar)	ESM-3201-34-*	ESM-3301-34-*	E5SM-3201-34-*	.06 (.87)	.106 (1.5)
	100 psi (6.9 bar)	ESM-3201-44-*	ESM-3301-44-*	E5SM-3201-44-*	.106 (1.5)	.106 (1.5)
	75 psi (5.2 bar)	ESM-3201-66-*	ESM-3301-66-*	-----	.21 (3.1)	.21 (3.1)
	60 psi (4.1 bar)	-----	-----	E5SM-3201-64-*	.21 (3.1)	.106 (1.5)
	50 psi (3.4 bar)	ESM-3201-86-*	ESM-3301-86-*	-----	.26 (3.8)	.21 (3.1)
	30 psi (2.1 bar)	-----	-----	E5SM-3201-84-*	.26 (3.8)	.106 (1.5)
20 psi (1.4 bar)	ESM-3201-126-*	ESM-3301-126-*	-----	.56 (8.1)	.21 (3.1)	
Vacuum (AC only)	ESM-3201-166-*	ESM-3301-166-*	-----	.79 (11.5)	.21 (3.1)	
3-Way, 3/2 Normally Open Piped Exhaust	150 psi (10.0 bar)	ESM-3202-43-H2-*	ESM-3302-43-H2-*	-----	.06 (.87)	.106 (1.5)
	125 psi (8.6 bar)	-----	-----	E5SM-3202-33-H2-*	.06 (.87)	.06 (0.87)
	100 psi (6.9 bar)	ESM-3202-44-H2-*	ESM-3302-44-H2-*	-----	.106 (1.5)	.106 (1.5)
	100 psi (6.9 bar)	ESM-3202-84-H2-*	ESM-3302-84-H2-*	-----	.106 (1.5)	.26 (3.8)
	100 psi AC only (6.9 bar)	-----	-----	E5SM-3202-44-H2-*	.106 (1.5)	.106 (1.5)
	75 psi (5.2 bar)	ESM-3202-66-H2-*	ESM-3302-66-H2-*	-----	.21 (3.1)	.21 (3.1)
75 psi (5.2 bar)	ESM-3202-86-H2-*	ESM-3302-86-H2-*	-----	.21 (3.1)	.26 (3.8)	
75 psi DC only (5.2 bar)	-----	-----	E5SM-3202-44-H2-*	.106 (1.5)	.106 (1.5)	
3-Way, 3/2 Normally Closed QUICK EXHAUST	Operating Pressure†	-----	-----	1/4" NPT Inlet & Outlet 3/8" NPT Exhaust	-----	-----
	5-150 psi (0.3-10 bar)	-----	-----	E5QE-30303-316-*	.055 (.80)	3.3 (48)
	5-100 psi (0.3-6.9 bar)	-----	-----	E5QE-30404-316-*	.075 (1.1)	3.3 (48)

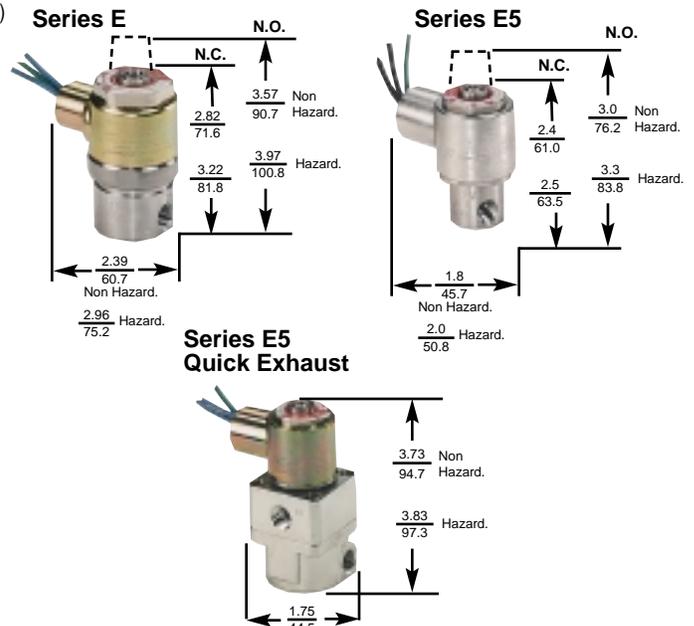
† MPa = $\frac{\text{bar}}{10}$

*Add coil code to valve number (ordinary page 23; hazardous page 25).

3-WAY DIRECT SOLENOID OPTIONS (Consult page number indicated for complete description of desired option.)

Series E Suffix	SOLENOID OPERATOR – (nonhazardous location)	Series E5 Suffix
-HC or -HCC:	DIN style coil & connector, (page 22/23)	-HC or -HCC
-PC:	Potted coil, (page 26)	-PC
-----	SOLENOID OPERATOR – (hazardous location)	-LB-XX; -LB-XN
-XDAS or T	Flameproof (page 24/25)	-----
-XX		-XX
-----		-XN
-PS-XX		-PC-XX
-XMAA, E, F or G	Encapsulation (page 24/25)	-----
-XMF A, E, F or G		-----
-XIFA, E or F	Intrinsically Safe (page 24/25)	-XISP
	MISCELLANEOUS	
-3	FKM (fluorocarbon) seals (Page 27)	-3
-HT	Class H coil (page 27)	-HT
-M, -M5R, -MAE	Manual Override (page 27)	-----

DIMENSIONS inches FOR BASIC VALVE mm



BODYPORTED VALVES

STAINLESS STEEL CONSTRUCTION

SERIES V316 Bodyported 3-Way and 4-Way Solenoid Valves

General Description

Versa Series V316 valves are available in 1/4" NPT, 3/8" NPT, or 1/2" NPT port sizes. Three-way designs are provided with 3 ports; four-way designs have 5 ports. Each is available for 2-position or 3-position service.



Investment cast 316 stainless steel bodies and actuating caps, coupled with 316 stainless steel internals makes this valve series compatible for use with aggressive media and environments.

Each valve is solenoid/pilot actuated, which enables the use of physically small solenoids and resultant low power consumption, and also assures a large positive shifting force without fear of coil burnout. A complete selection of electrical connections, area classifications, and power requirements makes the most exacting and demanding specifications or applications easy to satisfy.

Materials

Valve body, actuating caps, internal parts: 316 stainless steel
 Valve seals: FKM (fluorocarbon)
 Screws: stainless steel
 Solenoid parts: sleeve, plunger & spring— 304, 430F and 302 stainless steel
 coils—epoxy molded
 coil cover (when applicable)—zinc chromate coated steel

Porting Size

Inlet, outlet, & exhaust: 1/4" NPT, 3/8" NPT, or 1/2" NPT

Flow Rates (average for all ports)

1/4" NPT: $C_V = 1.8$ ($K_V = 26$)
 3/8" NPT: $C_V = 2.0$ ($K_V = 29$)
 1/2" NPT: $C_V = 5.5$ ($K_V = 80$)

Operating Pressures and Weights

Valve Type	Port Size	Operating Pressure Range [†] Pneumatic	Approximate Weights							
			Ordinary Service				Hazardous Service ^{††}			
			3-way		4-way		3-way		4-way	
			lbs.	kg	lbs.	kg	lbs.	kg	lbs.	kg
Single Solenoid/spring return (2-position)	1/4" & 3/8" NPT 1/2" NPT	40-175 psi (2.8-12 bar)	2.5	1.2	2.8	1.3	2.7	1.2	3.2	1.5
			3.4	1.6	3.2	1.5	3.6	1.6	3.6	1.6
Double Solenoid/momentary contact (2-position)	1/4" & 3/8" NPT 1/2" NPT	20-175 psi (1.4-12 bar)	3.4	1.6	3.9	1.8	3.8	1.7	4.3	2.0
			4.3	2.0	4.3	2.0	4.7	2.1	4.7	2.1
Double Solenoid/spring centered (3-position)	1/4" & 3/8" NPT 1/2" NPT	40-175 psi (2.8-12 bar)	3.5	1.6	4.0	1.8	3.9	1.8	4.4	2.0
			5.0	2.3	5.0	2.3	5.4	2.5	5.4	2.5

[†] Pressure range may change based on solenoid options. See page 23/25.

$$\text{MPa} = \frac{\text{bar}}{10}$$

^{††} Weights shown for hazardous service are for -XX type. For other suffix options consult factory.

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation.
 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended.
 Ambient temperature range -10°F (-23°C) to 200°F (95°C).

Series V316 Bodyported Valve Product Number Selector

BASIC VALVE NUMBER							
Function	Port Size (NPT)	Flow Cv	Flow (Kv)	Single Solenoid/Spring Return, 2-Position	Double Solenoid/Momentary Contact 2-Position	Double Solenoid/Spring Centered, 3-Position	
						Blocked Center	Exhaust Ports Open
3-way, 3/2 Normally Closed	1/4" 3/8" 1/2"	1.8 2.0 5.5	(26) (29) (80)	VSG-3321-U-316- VSG-3421-U-316- VSG-3521-U-316- 	VGG-3321-U-316- VGG-3421-U-316- VGG-3521-U-316- 		-----
3-Way, 3/3 Three-Position	1/4" 3/8" 1/2"	1.8 2.0 5.5	(26) (29) (80)			VXX-3323-U-316- VXX-3423-U-316- VXX-3523-U-316- 	-----
3-way, 3/2 Normally Open	1/4" 3/8" 1/2"	1.8 2.0 5.5	(26) (29) (80)	VGS-3322-U-316- VGS-3422-U-316- VGS-3522-U-316- 	SEE ABOVE -----	----- SEE ABOVE	-----
3-Way, 3/3 Three-Position	1/4" 3/8" 1/2"	1.8 2.0 5.5	(26) (29) (80)		-----	SEE ABOVE	-----
4-Way 5/2 & 5/3	1/4" 3/8" 1/2"	1.8 2.0 5.5	(26) (29) (80)	VSG-4322-U-316- VSG-4422-U-316- VSG-4522-U-316- 	VGG-4322-U-316- VGG-4422-U-316- VGG-4522-U-316- 	VXX-4323-U-316- VXX-4423-U-316- VXX-4523-U-316- 	VXX-4324-U-316- VXX-4424-U-316- VXX-4524-U-316-

* Add coil code to valve number (ordinary page 23; hazardous page 25).

SERIES V316 BODYPORTED SOLENOID OPTIONS

(Consult page number indicated for complete description of desired option.)

Coil & Coil Housing - nonhazardous location

- Suffix
 none: Std coil & housing, (page 26)
 -HT: Class H coil, (page 27)
 -HC or -HCC: DIN style coil & connector, (page 26)
 -PC: Potted coil, (page 26)

Manual Override

- Suffix
 -ME: Manual override (page 27)

Solenoid Operator - nonhazardous location

- Suffix
 none: Std coil & housing, (page 22/23)
 -HC or -HCC: DIN style coil and connector, (page 22/23)

Solenoid Operator - hazardous location

- Suffix
 -ST: Stainless steel coil cover (page 26)
 -LB-XX;-LB-XN Low power (1.8 W) operator, (page 24/25)
 -XX
 -PC-XX; -PC-XN
 -XN
 -XDAS,T
 -XIFA, E or F
 -XISP
 -XMAA, E, F, G
 -XMFA, E, F, G
 } (page 24/25)

Voltage (coil code) - Nonhazardous location operators - (page 22/23)

Hazardous location operators - (page 24/25)

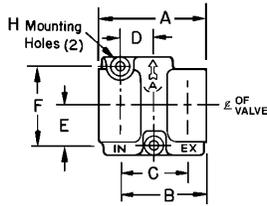
For other coil voltages consult factory.

BODYPORTED VALVES

STAINLESS STEEL CONSTRUCTION

BODYPORTED SERIES V316 Dimensions†

THREE-WAY

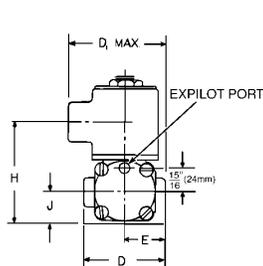
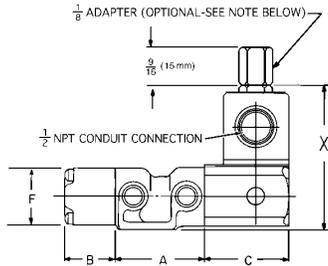


BODY DETAIL

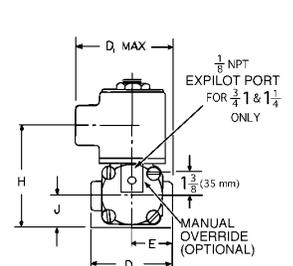
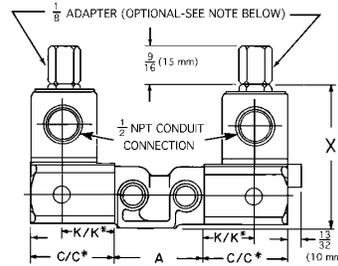
Basic Valve Dimensions

NPT	A		B		C		D		E		F		HØ	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4	2 ³ / ₁₆	56	1 ³ / ₄	44	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5
3/8	2 ³ / ₁₆	56	1 ²³ / ₃₂	44	1 ¹ / ₄	32	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5
1/2	4	102	3 ⁵ / ₁₆	84	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5

SINGLE SOLENOID



DOUBLE SOLENOID

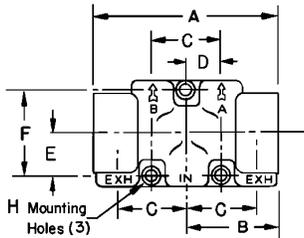


Basic Valve Dimensions

NPT	A		B		C		C*		D1		D		E		F		H		J		X	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4-3/8	2 ³ / ₁₆	56	1 ⁵ / ₃₂	29	1 ⁸ / ₈	41	2 ⁹ / ₁₆	65	2 ¹ / ₂	64	2	51	1	25	1 ¹ / ₂	38	2 ⁷ / ₈	73	3/4	19	3 ³ / ₄	95
1/2	4	102	1 ⁵ / ₃₂	29	1 ⁸ / ₈	41	2 ⁹ / ₁₆	65	2 ¹ / ₂	64	2 ¹ / ₂	64	1 ¹ / ₄	32	1 ¹ / ₂	38	2 ⁷ / ₈	73	3/4	19	3 ³ / ₄	95

*Dimensions for Spring-Centering Valves. NOTE: Adapter is supplied when specified by adding suffix "-H2" to product number.

FOUR-WAY

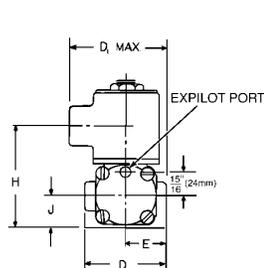
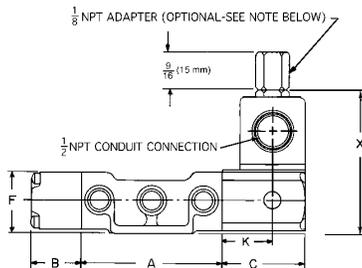


BODY DETAIL

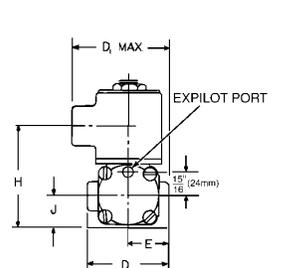
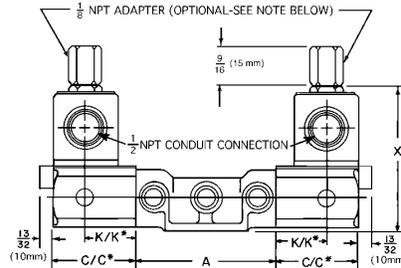
Basic Valve Dimensions

NPT	A		B		C		D		E		F		HØ	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4-3/8	3 ¹ / ₂	89	1 ³ / ₄	44	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5
1/2	4	102	2	51	1 ⁵ / ₁₆	33	2 ¹ / ₃₂	17	5 ¹ / ₆₄	20	1 ¹⁹ / ₃₂	40	.256	6.5

SINGLE SOLENOID



DOUBLE SOLENOID



Basic Valve Dimensions

NPT	A		B		C		C*		D1		D		E		F		H		J		X	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4-3/8	3 ¹ / ₂	89	1 ⁵ / ₃₂	29	1 ⁸ / ₈	41	2 ⁹ / ₁₆	65	2 ¹ / ₂	64	2	51	1	25	1 ¹ / ₂	38	2 ⁷ / ₈	73	3/4	19	3 ³ / ₄	95
1/2	4	102	1 ⁵ / ₃₂	29	1 ⁸ / ₈	41	2 ⁹ / ₁₆	65	2 ¹ / ₂	64	2 ¹ / ₂	64	1 ¹ / ₄	32	1 ¹ / ₂	38	2 ⁷ / ₈	73	3/4	19	3 ³ / ₄	95

*Dimensions for Spring-Centering Valves. NOTE: Adapter is supplied when specified by adding suffix "-H2" to product number.

†Dimensions shown are for basic valve as listed on previous page. Some options may change the dimensions, for which consult factory.

BRASS OR STAINLESS STEEL CONSTRUCTION

3-Way NC Solenoid Operated/Spring Return Lockout Valves



General Description

Versa 3-way normally closed Lockout Valves function the same as a solenoid operated-spring return valve, except that a means is provided to allow the valve to be physically locked with a padlock or hasp with padlock in order to prevent accidental actuation. Two types of lockout are available: one provides the ability for locking the valve in the un-energized position whereby the inlet is blocked and the exhaust is open; the other type provides the ability for locking in either the un-energized or energized position.

Types Available

	Series V	Series V316
Media:	Pneumatic Service	Pneumatic Service
Pressure: (minimum depends on valve size)	40 or 50 to 175 psi (2.8 or 3.5 - 12 bar)	40 to 175 psi (2.8 - 12 bar)
Construction Materials:	Forged & machined brass; NBR (nitrile) O ring seals	Investment cast & machined 316 stainless steel; FKM (fluorocarbon) seals
Functional Type:	3-way normally closed	3-way normally closed
Body Style:	Bodyported	Bodyported
Port Sizes & Flow:	1/8"NPT or G1/8 (C _V = 1.4, K _V = 20.3) 1/4"NPT or G1/4 (C _V = 1.8, K _V = 26.1) 3/8"NPT or G3/8 (C _V = 3.4, K _V = 49.3) 1/2"NPT or G1/2 (C _V = 4.0, K _V = 58.0) 3/4"NPT (C _V = 9.7, K _V = 140.6) 1"NPT (C _V = 11.1, K _V = 161.0)	1/4"NPT (C _V = 1.8, K _V = 26) 3/8"NPT (C _V = 2.0, K _V = 29) 1/2"NPT (C _V = 5.5, K _V = 80)
Actuation:	Solenoid/pilot-spring return for either Ordinary Service or Hazardous Service.	Solenoid/pilot-spring return for either Ordinary Service or Hazardous Service.

Lockout Valves Product Number Selector

FUNCTION	PORT SIZE	FLOW Cv	FLOW (Kv)	Series V		Series V316		OPERATING PRESSURE
				LOCKOUT IN EXHAUST POSITION	LOCKOUT IN EITHER POSITION	LOCKOUT IN EXHAUST POSITION	LOCKOUT IN EITHER POSITION	
3-way NC	1/8" NPT**	1.4	(20.3)	VIA-3221-138-LOVB-*	VIA-3221-138-LOVE-*	-----	-----	40-175 psi (2.8-12 bar)
	1/4" NPT**	1.8	(26.1)	VIA-3321-138-LOVB-*	VIA-3321-138-LOVE-*			
	1/4" NPT	1.8	(26)			VIA-3321-316-138-LOVB-*	VIA-3321-316-138-LOVE-*	
	3/8" NPT**	3.4	(49.3)	VIA-3421-138-LOVB-*	VIA-3421-138-LOVE-*			
	3/8" NPT	2.0	(29)			VIA-3421-316-138-LOVB-*	VIA-3421-316-138-LOVE-*	
	1/2" NPT**	4.0	(58)	VIA-3521-138-LOVB-*	VIA-3521-138-LOVE-*			
	1/2" NPT	5.5	(80)			VIA-3521-316-138-LOVB-*	VIA-3521-316-138-LOVE-*	
	3/4" NPT	9.7	(140.6)	VIA-3621-138-LOVB-*	VIA-3621-138-LOVE-*	-----	-----	50-175 psi (3.5-12 bar)
1" NPT	11.1	(161)	VIA-3721-138-LOVB-*	VIA-3721-138-LOVE-*	-----	-----		

* Add coil code to valve number (ordinary page 23; hazardous page 25).

** Valves with ISO 228 "G" threads are designated by utilizing Suffix "-2B" in model number

Options

Options available for Series V Lockout Valve are the same as listed on page 11.

Options available for Series V316 Lockout Valve are the same as listed on page 15.

Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation.

40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended.

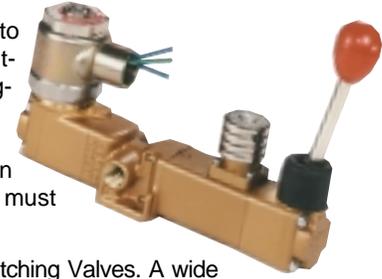
Ambient temperature range -10°F (-23°C) to 200°F (95°C).

LATCHING/MANUAL RESET VALVES

BRASS OR **STAINLESS STEEL** CONSTRUCTION

General Description

Latching valves are particularly suited to applications where it is desirable or mandatory to manually reset or restart a system. A typical application could involve the emergency shut-down of automatically monitored process operations. Loss or interruption of the control signal to the valve actuator causes the valve to shift, latch and shut-down a process step. When the signal is restored the valve remains in the latched position until the operator manually unlatches it and allows the process step to resume. Positive latching in such an application is vitally important since many process operations are sequential and one step must not be started until the one ahead of it has started.



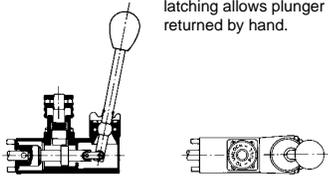
This example is only one of many which can be accommodated through the use of Versa's Latching Valves. A wide range of functional types, port sizes, actuators, and latching arrangements provide the engineer with a complete choice of valving to suit his particular needs.

Types Available

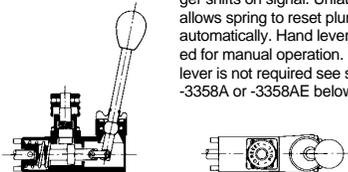
	Series V	Series V316
Media	Pneumatic; others, consult factory.	Pneumatic and various other gases, including corrosives.
Pressure: (minimum depends on size and type)	20 or 55 to 175 psi (1.4 or 3.8 to 12 bar)	20 or 55 to 175 psi (1.4 or 3.8 to 12 bar)
Construction Materials	Forged & machined brass; NBR (nitrile) O ring seals	Investment cast & machined 316 stainless steel; FKM (fluorocarbon) seals
Functional Type	3-way normally closed 3-way normally open 3-way 3-position 4-way 2 & 3 position	3-way normally closed 3-way normally open 3-way 3-position 4-way 2 & 3 position
Body Style	Bodyported	Bodyported
Port Sizes & Flow	1/8"NPT or G1/8 (C _V = 1.4, K _V = 20.3) 1/4"NPT or G1/4 (C _V = 1.8, K _V = 26.1) 3/8"NPT or G3/8 (C _V = 3.4, K _V = 49.3) 1/2"NPT or G1/2 (C _V = 4.0, K _V = 58.0) 3/4"NPT (C _V = 9.7, K _V = 140.6) 1"NPT (C _V = 11.1, K _V = 161.0)	1/4"NPT (C _V = 1.8, K _V = 26) 3/8"NPT (C _V = 2.0, K _V = 29) 1/2"NPT (C _V = 5.5, K _V = 80)
Actuation	Solenoid/pilot for either ordinary service or hazardous service.	Solenoid/pilot for either ordinary service or hazardous service.

LATCHES IN ACTUATED POSITION

Series V, Suffix "-181B"
Series V316, Suffix "-181BE" Latches automatically when plunger shifts on signal. Unlatching allows plunger to be returned by hand.



Series V, Suffix "-181C"
Series V316, Suffix "-181CE" Latches automatically when plunger shifts on signal. Unlatching allows spring to reset plunger automatically. Hand lever provided for manual operation. (If hand lever is not required see suffix -3358A or -3358AE below.)



Series V, Suffix "-3358A"
Series V316, Suffix "-3358AE" Latches automatically when plunger shifts on signal. Unlatching allows spring to reset plunger automatically. (If hand lever is required for manual actuation see suffix -181C or -181CE above.)



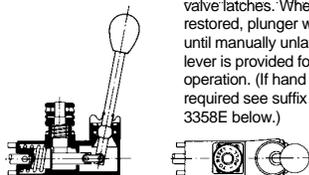
Latching/Reset Devices For Series V or V316 Valves

The Latching Device actuator consists of the latch, with or without an integral spring for returning the valve plunger, and an inline hand operator where needed to manually shift the valve.

The specific Latching Device may be attached to any Series "V" valve body size or style up to 1" NPT or any Series V316 valve body up to 1/2" NPT, as indicated for the type of latching/reset device required. The actuator on the opposite end of the valve body would be a solenoid/pilot device.

LATCHES IN UNACTUATED POSITION

Series V, Suffix "-181D"
Series V316, Suffix "-181DE" Unlatching allows plunger to shift on signal. If signal is lost, spring shifts plunger automatically and valve latches. When signal is restored, plunger will not shift until manually unlatched. Hand lever is provided for manual operation. (If hand lever is not required see suffix -3358 or -3358E below.)

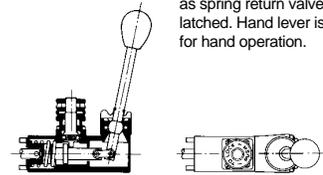


Series V, Suffix "-3358"
Series V316, Suffix "-3358E" Unlatching allows plunger to shift on signal. Spring returns plunger automatically and valve latches. (If hand lever is required for manual actuation see suffix -181D or -181DE above.)



LATCHES IN EITHER POSITION

Series V, Suffix "-181AA"
Series V316, Suffix "-181AAE" (2 position latch) Valve may be manually latched in either offset position or left unlatched. Acts as spring return valve when not latched. Hand lever is provided for hand operation.



How to specify LATCHING/RESET VALVES

V AG - 3 5 2 1 - 181B - (OPTIONS)

V = Pneumatic service: nominal 20 to 175 psi (1.4 - 12 bar); pressure range may vary depending upon specific valve type. See page 10 for Series V, page 14 for Series V316.

AG=Solenoid/pilot operated (NEMA 1,2,3) for 3-way NC or 4-way

GA=Solenoid/pilot operated (NEMA 1,2,3) for 3-way NO

3 = Three-way
4 = Four-way

2 = 1/8"NPT (Series V*)
3 = 1/4"NPT (Series V* or V316)
4 = 3/8"NPT (Series V* or V316)
5 = 1/2"NPT (Series V* or V316)
6 = 3/4"NPT (Series V)
7 = 1"NPT (Series V)

2 = Threaded sideports-INPilot solenoid: no auxilliary pilot required.

1 = 3-way NC
2 = 3-way NO, 4-way/2-position
3 = 4-way/3-position (blocked center)
4 = 4-way/3-position (exhaust ports open in center)

LOCKING/RESET DEVICE

(refer to page 18 for specific device required)

Series V	Series V316
181AA	316-181AAE
181B	316-181BE
181C	316-181CE
181D	316-181DE
3358	316-3358E
3358A	316-3358AE

OPTIONS (Refer to pages 22 to 27 for specific certifications, standards & classifications, approvals, and protective codes.)

	Series V	Series V316	
Electrical Connection/ Coil Cover	-HC -HCC	-HC -HCC	
Seals	-11 -155	----- -----	
Solenoids for Hazardous Service	-XX	-XX	Flameproof
	-XN	-XN	
	-XDAS,T	-XDAS,T	
	-3567	-LB-XX	Encapsulation
	-LB-XN	-LB-XN	
	-XMAA, E, F, G	-XMAA, E, F, G	
-XMFA, E, F, G	-XMFA, E, F, G	Intrinsically safe	
-XISP	-XISP		
-XIFA, E or F	-XIFA, E or F		
Options for Special Conditions-HT	-3	-----	
	-PS	-PC	
	-HT	-HT	
	-G,-M,-M5R	-ME	
	-TR50-ST	-ST	

Voltage (coil code) } See page 23 for ordinary location and page 25 for hazardous location.

*Valves with ISO 228 "G" Threads are designated by utilizing suffix "-2B" in model number.

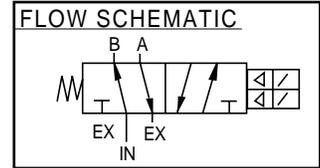
Installation, Filtration and Lubrication Valves have no limitations on mounting orientation. 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended. Ambient temperature range -10°F (-23°C) to 200°F (95°C).

REDUNDANT VALVES

BRASS OR **STAINLESS STEEL** CONSTRUCTION

General Description

When parallel electronic control circuits are utilized in a system, if a complete control circuit fails or requires maintenance, the parallel circuit will keep the system running. In a parallel circuit Versa's Redundant Valve functions the same as a solenoid operated-spring return valve, except that it has two solenoids (one for each of the parallel circuits) rather than one solenoid. Either or both of these solenoids will shift and maintain the controlled device in the shifted position. Both solenoids must be de-energized to return the controlled device to the unshifted position. The use of one Redundant Valve can replace multiple valves and components to accomplish the same function.



Types Available	SERIES V	SERIES V316
Media:	Pneumatic Service	Pneumatic Service
Pressure:	50 to 175 psi (3.5 to 12 bar)†	40 to 175 psi (2.8 to 12 bar)†
Construction Material:	Forged & machined brass; NBR (nitrile) O ring seals	Investment cast & machined 316 stainless steel, FKM (fluorocarbon) seals
Functional Types:	3-way, normally closed 4-way, 2 position	3-way, normally closed 4-way, 2 position
Port Sizes & Flow:	1/8" NPT or G1/8 (Cv=1.4,Kv=20.3) 1/4" NPT or G1/4 (Cv=1.8,Kv=26.1) 3/8" NPT or G3/8 (Cv=3.4,Kv=49.3) 1/2" NPT or G1/2 (Cv=4.0,Kv=58.0)	1/4" NPT (Cv=1.8,Kv=26) 3/8" NPT (Cv=2.0,Kv=29) 1/2" NPT (Cv=5.5,Kv=80)
Actuation:	Solenoid/pilot-spring return (2 solenoids per valve), for either ordinary or hazardous service.	Solenoid/pilot-spring return (2 solenoids per valve), for either ordinary or hazardous service.

† MPa = $\frac{\text{bar}}{10}$

Redundant Valves Product Number Selector

FUNCTION	SIZE	SERIES V	SERIES V316
3-Way, 3/2 Normally Closed	1/8"NPT**	VSA-3221-RS-*	VSA-3321-316-RS-*
	1/4"NPT**	VSA-3321-RS-*	VSA-3421-316-RS-*
	3/8"NPT**	VSA-3421-RS-*	VSA-3521-316-RS-*
	1/2"NPT**	VSA-3521-RS-*	
4-Way, 5/2	1/8"NPT**	VSA-4222-RS-*	VSA-4322-316-RS-*
	1/4"NPT**	VSA-4322-RS-*	VSA-4422-316-RS-*
	3/8"NPT**	VSA-4422-RS-*	VSA-4522-316-RS-*
	1/2"NPT**	VSA-4522-RS-*	

*Add coil code to valve number (ordinary page 23; hazardous page 25).

** V Series valves with ISO "G" threads are designated by utilizing Suffix "-2B" in model number.

Options

Options available for Series V Redundant Valves are the same as listed on page 11, except not all solenoid options are available. Consult factory.

Options available for Series V316 Redundant Valves are the same as listed on page 15, except not all solenoid options are available. Consult factory.

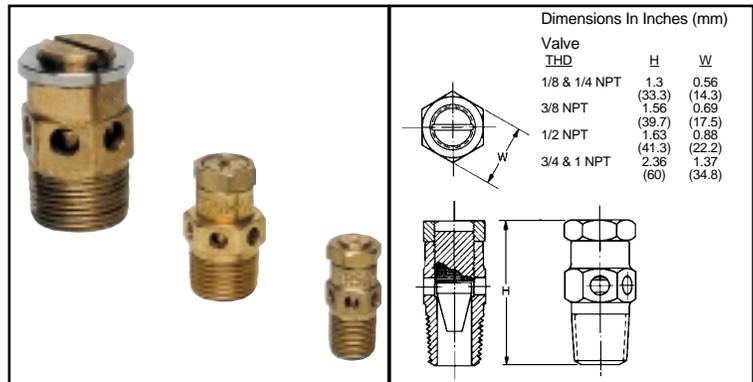
Installation, Filtration and Lubrication

Valves have no limitations on mounting orientation. 40 to 50 micron filtration and general purpose lubricating oil ISO, ASTM viscosity grade 32 recommended. Ambient temperature range -10°F (-23°C) to 200°F (95°C).

Bleed Control Valves

The VERSA Bleed Control Valve has a precision machined needle that provides an economical, effective flow control in pneumatic applications. The Bleed Control Valve can be threaded into the exhaust port of any VERSA directional control valve to provide speed control.

The flow area, through which the air passes to the atmosphere, can be finely adjusted by screwing the needle in or out. After the Bleed Control Valve has been adjusted to suit, it can be securely locked at its setting with the lock nut provided.



MATERIALS

Brass or 316 Stainless Steel (conforms to NACE standard MR-01-75)

PRESSURES

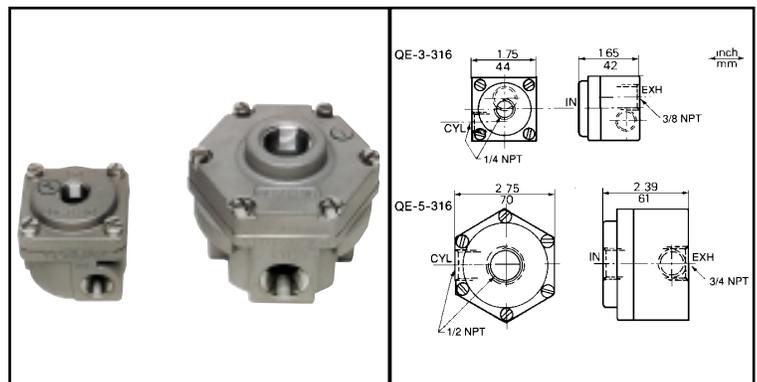
0-200 psi (0-14 bar) air

PRODUCT NUMBER

Brass	PRODUCT NUMBER	Stainless Steel
BC-2	1/8 NPT	-----
BC-3	1/4 NPT	BC-3-316
BC-4	3/8 NPT	BC-4-316
BC-5	1/2 NPT	BC-5-316
BC-6	3/4 NPT	BC-6-316
BC-7	1 NPT	-----

Quick Exhaust Valves

A Quick Exhaust Valve is a three-way, 3/2 valve with extra large exhaust orifice, to be fitted directly at a cylinder port connection. When pressure decreases at the inlet of the Quick Exhaust Valve, the outlet is automatically opened to the exhaust and the cylinder is quickly depressurized.



MATERIALS

Body: Electroless Nickel Plated Brass or 316 Investment Cast Stainless Steel (conforms to NACE standard MR-01-75)

Seals: FKM (fluorocarbon) O ring seals

Screws: 316 Stainless Steel

PRESSURES

5-150 psi (0.35-10 bar) air

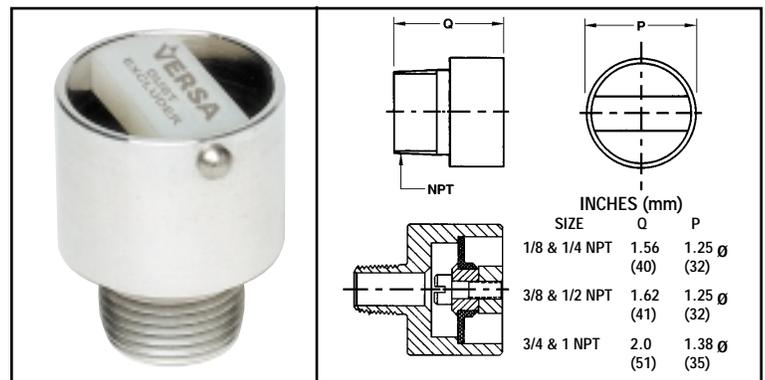
PRODUCT NUMBER

Electroless Nickel Plated Brass	Inlet & Cyl	Exh	Stainless Steel
QE-3	1/4 NPT	3/8 NPT	QE-3-316
-----	1/2 NPT	3/4 NPT	QE-5-316

Dust Excluders

Dust Excluders may be threaded into the exhaust ports in order to keep out dirt or dust in the atmosphere or surrounding the valve, that might enter through an other-wise open port.

Dust excluders are preferably mounted in a vertical position with the wide outlet opening down.



MATERIALS

Aluminum Body with NBR (Nitrile) seal or

316 Stainless Steel body (conforms to NACE standard MR-01-75) with CR (Neoprene) seal

PRESSURES

0-200 psi (0-14 bar) air

PRODUCT NUMBER

Aluminum	PRODUCT NUMBER	Stainless Steel
DE-2	1/8 NPT	-----
DE-3	1/4 NPT	DE-3-316
DE-4	3/8 NPT	DE-4-316
DE-5	1/2 NPT	DE-5-316
DE-6	3/4 NPT	DE-6-316
DE-7	1 NPT	-----

ELECTRICAL:

Solenoid/Pilot actuated valves are available with a variety of different solenoids for both nonhazardous and hazardous locations. Basic details of actuators for nonhazardous locations are listed below. Details for hazardous location actuators are listed on pages 24/25. For additional data consult factory. Product numbers and other details may be found on the appropriate pages for each specific valve type and series.

NONHAZARDOUS LOCATION SOLENOIDS

Suffix Identification	Protection Classification	Area Classification and (Gas Grouping)	Certification (Conformance)	Ingress Protection
Standard (Series E5 & E, V & V316)	General Purpose	Indoor & Outdoor	CSA-#LR45276	NEMA 1,2,3
Standard (NAMUR Series C5 & NAMUR Series E5, Series C5 & C7)	General Purpose	Indoor & Outdoor	CSA-#LR45276	NEMA 1,2,3
Low Watt (NAMUR Series C5, Series C5 & C7 -027 -043	General Purpose (Low Watt)	Indoor & Outdoor		NEMA 4 IP65 per IEC 529

PRODUCT NUMBER COIL CODES: Complete product numbers require, when applicable, a coil code that represents the desired coil current, frequency and voltage. The coil code takes the form shown below, with ratings and voltage substituted as required:

* Rating Code	### Voltage
A= 60Hz frequency D= Direct Current (DC) E= 50 Hz frequency	(indicated by three digits; as example, 24 volts = 024, 120 volts = 120.)

Voltage (Power)	Electrical Characteristics	Miscellaneous (For options other than those listed below see page 26/27.)
<p>All usual 50 Hz & 60 Hz AC (Series V=8.7W; Series E=8.7W; Series V316 & E5=6W). All usual DC (Series V=9.5W; Series E=9.5W; Series V316 & E5=7W).</p>	<p>Class A epoxy molded coil (105°C) with 2 leads 24" (61 cm). Continuous duty.</p>	<p>Steel chromate coated cover with 1/2 NPT conduit entry. For Mini DIN connector with PG9 cord grip, NEMA 4, IP65 per IEC 529 option: (-HC) For Mini DIN connector with 1/2 NPT conduit entry, NEMA 4, IP65 per IEC 529 option: (-HCC)</p>
<p>24V60, 120V60, 240V60 (8.5W, except 6W with NAMUR Series E5) 24V50, 110V50, 220V50, 240V50 (8.5W, except 6W with NAMUR Series E5) 12VDC, 24VDC, 48VDC (10.5W, except 7W with NAMUR Series E5)</p>	<p>Class A epoxy molded coil (105°C) with 3 spade terminals. Continuous duty.</p>	<p>For Mini DIN connector with PG9 cord grip, NEMA 4, IP65 per IEC 529 option: (-HC) For Mini DIN connector with 1/2 NPT conduit entry, NEMA 4, IP65 per IEC 529 option: (-HCC) For integrally epoxy molded coil and 1/2"NPT conduit connection with 2 wire leads 24" (61 cm), NEMA 4 option: (-228L) For steel chromate coated coil cover with 2 wire leads 24" (61 cm) option: (-C50).</p>
<p>6VDC, 12VDC, 24VDC, 48VDC (0.75W)</p> <hr/> <p>24V50, 110V50 (4.0VA) 230V50 (3.1VA) 24V60 (3.2VA) 110V60 (3.5VA) 120V60 (4.3VA) 230V60, 240V60 (3.7VA)</p> <hr/> <p>12VDC, 24VDC, 48VDC (2.9W)</p>	<p>Class F epoxy molded coil (155°C) with 3 spade terminals. Continuous duty.</p>	<p>For micromini 8 mm gap DIN style connector with cable gland option: (-HC).</p> <p>Maximum pilot pressure 115psi (8 bar).</p>

ELECTRICAL:

Solenoid/Pilot actuated valves are available with a variety of different solenoids for both nonhazardous and hazardous locations. Basic details of actuators for hazardous locations are listed below. Details for nonhazardous location actuators are listed on pages 22/23. For additional data consult factory. Product numbers and other details may be found on the appropriate pages for each specific valve type and series.

HAZARDOUS LOCATION SOLENOIDS

Suffix Identification	Protection Classification	Area Classification and (Gas Grouping)	Certification (Conformance)	Ingress Protection
-XX	Flameproof (d) NEMA 7 & 9	Division 1 & 2, Class I & II (Groups C,D,E,F,G)	UL-#E37068 CSA-#LR45277	NEMA 7 & 9
-XN	Flameproof (d) CENELEC: EN 50 014, & EN 50 018 EEx d IIB+H ₂ T4 & T6	Zones 1 & 2 (IIB+H ₂)	ISSeP-#84.103.380	IP66 per IEC 529
-XDAS or -XDAT	Flameproof (d) CENELEC: EN 50 014, & EN 50 018 EEx d IIC T5 (24VDC: T6)	Zones 1 & 2 (IIC)	CESI-#AD.88.B.075	IP66 & IP67 per IEC 529
-LB-XX or -3567	Flameproof (d) Low-Watt Type NEMA 7 & 9	Division 1 & 2, Class I & II (Groups C,D,E,F,G)	UL-#E37068 CSA-#LR45277	NEMA 7 & 9
-XMAA or -XMAE or -XMAF or -XMAG	Encapsulation (me) CENELEC: EN 50 014, EN 50 019, & EN 50 028 EEx me II T6 (ambient T max. 50°C) EEx me II T5 (ambient T max. 65°C) EMC: EN 50 081-1, & EN 50 082-1	Zones 1 & 2 (II)	KEMA E _x -98.E.1535X Gastec-#115881	IP66 & IP67 per IEC 529
-XMFA or -XMFE or -XMFF or -XMFG	Encapsulation (me) CENELEC: EN 50 014, EN 50 019, & EN 50 028 EEx me II T6	Zones 1 & 2 (II)	KEMA E _x -98.E.1535X	IP66 & IP67 per IEC 529
-XISP	Intrinsic Safe (ia) CENELEC: EN 50 014, & EN 50 020 EEx ia IIC T6 NEMA 4	Zones 0, 1 & 2 (IIC) Division 1 & 2, Class I, II & III (Groups A,B,C,D,E,F,G)	PTB-#Ex-94.C.4037 Factory Mutual-#4V 7A2.AX CSA-#LR51090	IP65 per IEC 529 NEMA 4
-XIFA or -XIFE or -XIFF	Intrinsic Safe (ib) CENELEC: EN 50 014, EN 50 020, & EN 50 028 EEx mib IIB T6	Zones 1 & 2 (IIB)	KEMA E _x -98.E.1534X	IP66 & IP67 per IEC 529

PRODUCT NUMBER COIL CODES: Complete product numbers require, when applicable, a coil code that represents the desired coil current, frequency and voltage. The coil code takes the form shown below, with ratings and voltage substituted as required:

Rating Code	*	###	Voltage
A= 60Hz frequency	└─┘		(indicated by three digits;
D= Direct Current (DC)			as example, 24 volts = 024,
E= 50 Hz frequency			120 volts = 120.)

Voltage (Power)	Electrical Characteristics	Miscellaneous
All usual 50 Hz & 60 Hz AC (5.6W, except Series E=7.3W and Series V=7.3W.) All usual DC (7.2W, except Series E=9.5W and Series V=9.5W.)	Class A epoxy molded coil (105°C). Continuous duty. 3 leads 24" (61 cm). For potted coil add: -PS (Series V or Series E); -PC (NAMUR C5 or NAMUR E5, Series C5/C7, V316 or E5).	Steel chromate coated coil housing with 1/2 NPT conduit entry. For 182FM stainless steel cover add: -ST (NAMUR C5 or NAMUR E5, Series C5/C7, E5 or V316); -TR50-ST (Series V).
All usual 50 Hz & 60 Hz AC (5.6W) All usual DC (7.2W)	Class A epoxy molded coil (105°C). Continuous duty. 3 leads 24" (61 cm). For potted coil add: -PC (NAMUR C5 or NAMUR E5, Series C5/C7, V316, E5); -PS (Series V).	Steel chromate coated coil housing with M20 x 1.5 conduit entry. Ground terminal on cover. For 182FM stainless steel cover add -ST (NAMUR C5 or NAMUR E5, Series C5/C7, E5, V or V316).
24V50, 230V50 (6W); 127V50,(10W); 24V60, 120V60, 240V60 (10W); 12VDC, 24VDC, 28VDC, 48VDC, 110VDC, . 125VDC (10W)	Class A epoxy molded coil (105°C). Continuous duty.	Stainless steel coil housing with internal screw terminals. Internal and external ground screw. M20 x 1.5 conduit entry: (-XDAS) 1/2 NPT conduit entry: (-XDAT)
12V60, 24V60, 48V60, 120V60, 240V60 (1.8W) 6VDC, 12VDC, 24VDC, 48VDC (1.8W)	Class A epoxy molded coil (105°C). Continuous duty. 3 leads 24" (61 cm).	Steel chromate coated coil housing with 1/2 NPT conduit entry. Approved use extends also to -XN (e.g. -LB-XN). Maximum pilot pressure 115 psi (8 bar).
24 VDC (4W) (Consult factory for other options)	Continuous duty Coil & Rectifier, including surge suppression, potted within housing.	Thick wall epoxy coil housing with integral junction box. Internal screw terminals for supply and ground. M20 x 1.5 conduit entry: (-XMAA) Cable gland for 6-12 mm ø cable: (-XMAE) 1/2 NPT conduit entry with stainless steel adapter: (-XMAF) Cable gland for 9-16mm ø cable: (-XMAG)
24 VDC (10W inrush, 2.6W holding)	Continuous duty. Coil & power controller potted within housing.	Thick wall epoxy coil housing with integral junction box. Internal screw terminals for supply and ground. M20 x 1.5 conduit entry: (-XMFA) Cable gland for 6-12 mm ø cable: (-XMFE) 1/2 NPT conduit entry with stainless steel adapter: (-XMFF) Cable gland for 9-16mm ø cable: (-XMFG)
24VDC system voltage prior to barrier (1.6W)	Class F epoxy molded coil (155°C total heat), with 3 spade terminals and mini DIN connector with PG9 cable gland. Continuous duty.	Requires the use of an approved safety barrier or isolator. Consult factory for approved barriers. Maximum operating system voltage before barrier 28VDC. Maximum pilot pressure 115 psi (8 bar). 1/2 NPT conduit entry: (-HCC)
24VDC (0.8W)	Continuous duty.. Response time: 1 second. Coil and power controller potted within housing.	Requires safety barrier. Maximum voltage 28 V, 100 mA. Thick wall epoxy coil housing & integral junction box. Internal screw terminals for supply and ground. M20 x 1.5 conduit entry: (-XIFA) Cable gland for 6-12 mm ø cable: (-XIFE) 1/2 NPT conduit entry with stainless steel adapter: (-XIFF)

OPTIONS AVAILABILITY CHART

Solenoid Options - Nonhazardous Location

		VALVE SERIES						
		NAMUR C5	NAMUR E5	C5/C7	E	E5	V	V316
	1/2" NPT Conduit entry, NEMA 1,2,3.	-C50	-C50	-C50	std	std	std	std
	1/2" NPT Conduit entry; Potted Coil NEMA 4X, 11, 12, 13.	-C50-PC	-PC	-C50-PC	-PC	-PC	-PC	-PC
	1/2" NPT Conduit entry; Integrally Molded Coil & Conduit Entry, NEMA 4/IP65.	-228L	-228L	-228L	n/a	n/a	n/a	n/a
	Spade Terminals, NORMAL WATTAGE; for mini DIN connector.	std	std	std	n/a	n/a	n/a	n/a
	Spade Terminals, LOW WATT, for micromini DIN connector.	-027 -043	n/a n/a	-027 -043	n/a n/a	n/a n/a	n/a n/a	n/a n/a
	Mini DIN Connector with PG9 cord grip, NORMAL WATTAGE, NEMA 4.	-HC	-HC	-HC	-HC	-HC	-HC	-HC
	Micromini DIN Connector with cord grip, LOW WATT, NEMA 4.	-027-HC -043-HC	n/a n/a	-027-HC -043-HC	n/a n/a	n/a n/a	n/a n/a	n/a n/a
	Mini DIN Connector with 1/2" NPT conduit entry, NORMAL WATTAGE, NEMA 4.	-HCC	-HCC	-HCC	-HCC	-HCC	-HCC	-HCC

Solenoid Options - Hazardous Location

		VALVE SERIES						
		NAMUR C5	NAMUR E5	C5/C7	E	E5	V	V316
	1/2" NPT Conduit entry, NEMA 7 & 9, UL & CSA.	-XX	-XX	-XX	-XX	-XX	-XX	-XX
	M20 x 1.5 Conduit entry, IP66. CENELEC; EEx d IIB+H ₂ T4/T6, ISSeP	-XN	-XN	-XN	n/a	-XN	-XN	-XN
	Stainless steel (182FM) coil cover for Hazardous Location Options:	-XX	-ST	-ST	n/a	-ST	-TR50-ST	-ST
		-XN	-ST	-ST	n/a	-ST	-ST	-ST
	Potted Coil (female threaded conduit connection) for Hazardous Location options, NEMA 4X, 11, 12, 13:	-XX	-PC	-PC	n/a	-PC	-TR50-PC	-PC
		-XN	-PC	-PC	n/a	-PC	-PC	-PC
	Potted Coil (male threaded conduit con- nection) for-XX Hazardous Location options, NEMA 4X, 11, 12, 13.	n/a	n/a	n/a	PS	n/a	PS	n/a
	LOW WATT Solenoid, NEMA 7 & 9, UL & CSA; for -XX Hazardous Location option.	-LB-XX	-LB-XX	-LB-XX	n/a	-LB-XX	-3567	-LB-XX
	CENELEC; EEx d IIB+H ₂ T4/T6	-LB-XN	-LB-XN	-LB-XN	n/a	-LB-XN	-LB-XN	-LB-XN

Solenoid Options - Hazardous Location Cont.

		VALVE SERIES						
		NAMUR C5	NAMUR E5	C5/C7	E	E5	V	V316
	CENELEC; EEx d IIC T5/T6, CESI.	n/a n/a	n/a n/a	n/a n/a	-XDAS -XDAT	n/a n/a	-XDAS -XDAT	-XDAS -XDAT
	CENELEC; EEx me II T5/T6, KEMA.	n/a n/a n/a n/a	n/a n/a n/a n/a	n/a n/a n/a n/a	-XMAA -XMAE -XMAF -XMAG	n/a n/a n/a n/a	-XMAA -XMAE -XMAF -XMAG	-XMAA -XMAE -XMAF -XMAG
	CENELEC; EEx me II T6, KEMA.	n/a n/a n/a n/a	n/a n/a n/a n/a	n/a n/a n/a n/a	-XMFA -XMFE -XMFF -XMFG	n/a n/a n/a n/a	-XMFA -XMFE -XMFF -XMFG	-XMFA -XMFE -XMFF -XMFG
	CENELEC; EEx mib IIB T6, KEMA.	n/a n/a n/a	n/a n/a n/a	n/a n/a n/a	-XIFA -XIFE -XIFF	n/a n/a n/a	-XIFA -XIFE -XIFF	-XIFA -XIFE -XIFF
	CENELEC; EEx ia IIC T6, PTB.	-XISP	n/a	-XISP	n/a	-XISP	-XISP	-XISP
	FM & CSA. Intrinsically Safe, NEMA 4/IP65							

Miscellaneous Options

		VALVE SERIES						
		NAMUR C5	NAMUR E5	C5/C7	E	E5	V	V316
Manual Override (Manually pressurizes pilot of solenoid/pilot actuator) 	Unguarded type; push & hold to operate.	--	--	--	-MAE	--	-M	-ME
	Unguarded locking type; push to operate and turn to lock.	-CML	--	-CML	-M5R	--	-M5R	--
	Guarded type; push & hold to operate (non-locking).	std	--	std	-M	--	-G	--
Seals	High nitrile compound suitable for "sweet" natural gas, ammonia, R11, 12 or 13 freon.	--	--	--	--	--	-11	--
	FKM (fluorocarbon) compound (included as standard on all hazardous location solenoids)	std	-3	std	-3	-3	-155	std
High Temperature Coil	Class H Coil*; recommended for applications above 150°F (65°C) and for DC continuous duty above 120°F (50°C) For nonhazardous or hazardous location.	-C50-HT	-C50-HT	-C50-HT	-HT	-HT	-HT	-HT

* Not available with spade terminals or DIN style connectors or suffix -228L.

WARNINGS REGARDING THE DESIGN APPLICATION, INSTALLATION AND SERVICE OF VERSA PRODUCTS

The warnings below must be read and reviewed before designing a system utilizing, installing, servicing, or removing a Versa product. Improper use, installation or servicing of a Versa product could create a hazard to personnel and property.

DESIGN APPLICATION WARNINGS

Versa products are intended for use where compressed air or industrial hydraulic fluids are present. For use with media other than specified or for non-industrial applications or other applications not within published specifications, consult Versa.

Versa products are not inherently dangerous. They are only a component of a larger system. The system in which a Versa product is used must include adequate safeguards to prevent injury or damage in the event of system or product failure, whether this failure be of switches, regulators, cylinders, valves or any other system component. System designers must provide adequate warnings for each system in which a Versa product is utilized. These warnings, including those set forth herein, should be provided by the designer to those who will come in contact with the system.

Where questions exist regarding the applicability of a Versa product to a given use, inquiries should be addressed directly to the manufacturer. Confirmation should be obtained directly from the manufacturer regarding any questioned application prior to proceeding.

INSTALLATION, OPERATION AND SERVICE WARNINGS

Do not install or service any Versa product on a system or machine without first depressurizing the system and turning off any air, fluid, or electricity to the system or machine. All applic-

able electrical, mechanical, and safety codes, as well as applicable governmental regulations and laws must be complied with when installing or servicing a Versa product.

Versa products should only be installed or serviced by qualified, knowledgeable personnel who understand how these specific products are to be installed and operated. The individual must be familiar with the particular specifications, including specifications for temperature, pressure, lubrication, environment and filtration for the Versa product which is being installed or serviced. Specifications may be obtained upon request directly from Versa. If damages should occur to a Versa product, do not operate the system containing the Versa product. Consult Versa for technical information.

LIMITED WARRANTY DISCLAIMER AND LIMITATION OF REMEDIES

Products sold by Versa are warranted to be free from defective material and workmanship for a period of ten years from the date of manufacture, provided said items are used in accordance with Versa specifications. Versa's liability pursuant to that warranty is limited to the replacement of the Versa product proved to be defective provided the allegedly defective product is returned to Versa or its authorized distributor.

Versa provides no other warranties, expressed or implied, except as stated above. There are no implied warranties of merchantability or fitness for a particular purpose. Versa's liability for breach of warranty as herein stated is the only and exclusive remedy and in no event shall Versa be responsible or liable for incidental or consequential damages.

