

CONTINENTAL



CONTINENTAL HYDRAULICS

# VSNG6

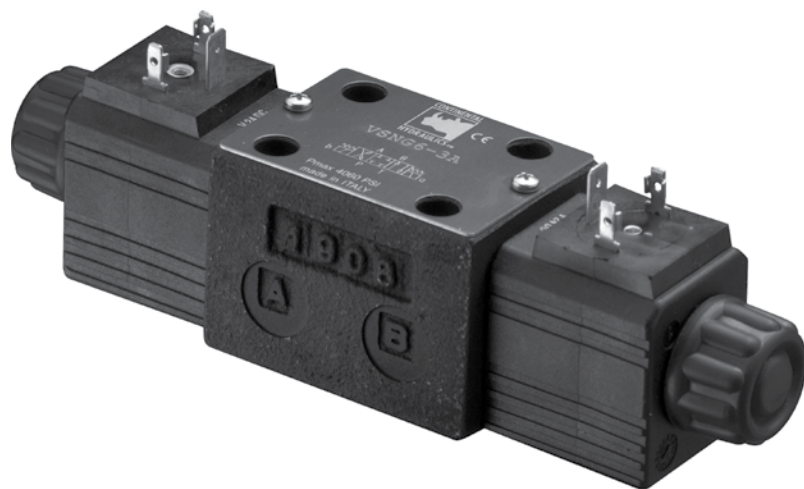
SOLENOID OPERATED DIRECTIONAL CONTROL VALVE COMPACT SIZE



VSNG6 - SOLENOID OPERATED DIRECTIONAL CONTROL VALVE COMPACT SIZE

# VSNG6

## SOLENOID OPERATED DIRECTIONAL CONTROL VALVE COMPACT SIZE



### DESCRIPTION

Direct acting, subplate mounted directional control valve, with mounting surface according to NFPA D03 ISO 4401-03 (CETOP RP 121H) standards suitable for mini-power packs and mobile and agricultural applications. The valve body is made with high strength iron castings with wide internal passages in order to minimize the flow pressure drop.

### OPERATIONS

The valve can be supplied for valve functions requiring 2 positions or 3 positions, as well as 3 way or 4 way flow functions.

This valve is designed using DC voltage core tubes. The design makes this series of valves the perfect choice for flexibility and reduced inventory levels when various voltages or coil connections are required.

The DC core tubes will accept any one of the DIN 43650, AMP Junior, lead wire, DEUTSCH DT04-2P or AMP Super Seal coil connections. Various DC Voltage coils and AC Voltage coils (Rectification of the AC power is processed through the DIN Connector circuit).

The valve is supplied with a boot protected manual override which ensure IP65 protection or better dependent on the coil termination style selected.

A stroke limiter knob for the valve spool is available as accessory.

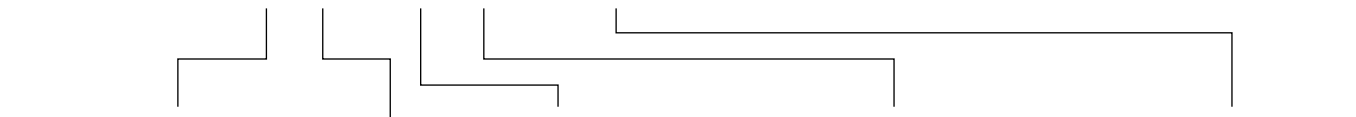
### TYPICAL PERFORMANCE SPECIFICATIONS

<b>MAXIMUM OPERATING PRESSURE:</b>	P - A - B Ports	4000 psi	280 bar
	T Port	3600 psi	250 bar
<b>MAXIMUM FLOW RATE</b>		12 gpm	45 l/min
<b>MOUNTING SURFACE</b>		NFPA D03 ISO 4401-03-02-0-03	
<b>CYCLE RATE</b>	DC Solenoid	Up to 10000 Cycles/hr	
<b>WEIGHT</b>	DC Single Solenoid	2.54 lbs	1.1 Kg
	DC Dual Solenoid	3.13 lbs	1.4 Kg

<b>RANGE TEMPERATURES:</b>	Ambient	- 4 to +130° F	-20 to +54° C
	Fluid	- 4 to +180° F	-20 to +82° C
<b>FLUID VISCOSITY</b>	Range	60 -1900 SUS	10 -400 cSt
	Recommended	120 SUS	25 cSt
<b>FLUID CONTAMINATION</b>		ISO 4406:1999 Class 20/18/15	

# IDENTIFICATION CODE

**VSNG6** -  -  - **D00** -  \_\_\_\_\_ DESIGN LETTER



FUNCTION	
<b>1</b>	<p>Single Operator 2 Position Spring Offset</p>
<b>2</b>	<p>Dual Operator 2 Position Detented (No Spring)</p>
<b>3</b>	<p>Dual Operator 3 Position Spring Centered</p>
<b>5</b>	<p>Single Operator 2 Position Spring Centered</p>
<b>9</b>	<p>Single Operator 2 Position 3 Way Spring Offset</p>

SEAL	
<b>A</b>	Buna (STD)
<b>G</b>	Viton

MECHANICAL OMIT IF NOT REQUIRED	
<b>R</b>	Single Solenoid 'B' Port End. Available Only with Function 1,5 and 9.

CORE TUBE	
<b>D00</b>	DC Tube Without Coils. See Note.

TYPICAL ORDERING CODE:  
**VSNG6-1A-AR-D00-A**

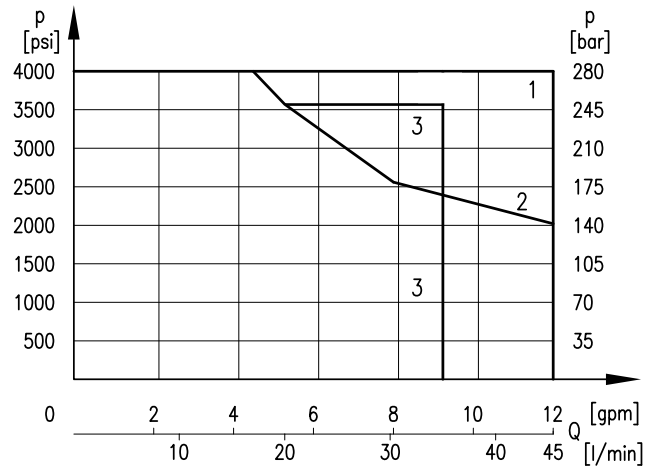
**NOTE:**  
Coil supplied separately.  
See coils section on page 6.

SPOOLS					
NAME	SYMBOLS	FUNCTION	CENTER POSITION	CROSSOVER	FUNCTION MATCHING
<b>A</b>			All ports blocked	All ports blocked	1, 2, 3, 5
<b>B</b>			All ports open	All ports open	1, 3, 5
<b>F</b>			P blocked, A→T and B→T	P blocked, A→T and B→T	3, 5
<b>L</b>			P→T, A and B blocked	All ports open, restricted	3, 5
<b>X</b>			-	All port blocked	9

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# PERFORMANCE CURVE

## DC SOLENOID VALVE

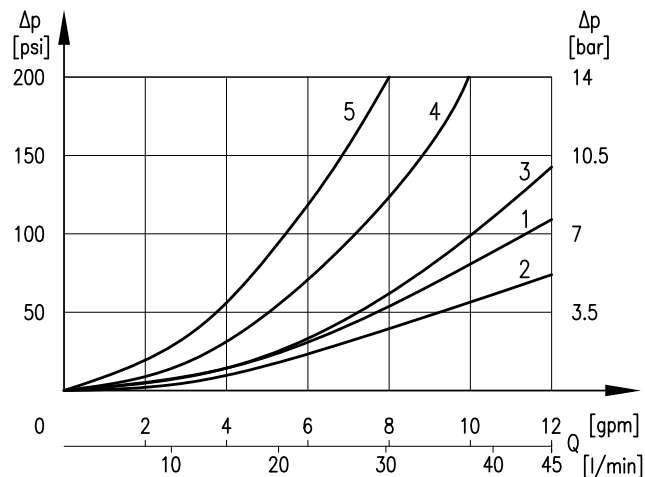


CURVE	SPOOLS
1	1A, 2A, 3A, 3B, 5A, 5B, 9X
2	3F, 5F
3	3L, 5L

### NOTES:

1. The values indicated in the graphs are relevant to the standard solenoid valve, with D24K1 coils.
2. Valve performance was tested in a four way circuit (full loop). Performances may be reduced from that shown when used in a three-way circuit (half circuit), i.e. A or B port plugged.
3. The values have been obtained according to ISO 6403 norm with solenoids at rated temperature and supplied with voltage equal to 90% of the nominal voltage. The value have been obtained with filtration according to ISO 4406:1999 class 18/16/13.

## PRESSURE DROPS $\Delta p$ -Q (OBTAINED WITH VISCOSITY OF 36 cSt at 50°C)



SPOOL	FLOW CURVE NUMBER				
	SHIFTED				CENTERED
	P→A	P→B	A→T	B→T	
3A, 5A	1	1	1	1	
3B, 5B	1	1	2	2	3
3F, 5F	3	3	2	2	
3L, 5L	5	5	5	5	5
2A	1	1	1	1	
1A	4	4	4	4	

## SWITCHING TIMES

SUPPLY	TIMES ( $\pm 10\%$ ) [ms]	
	ENERGIZING	DE-ENERGIZING
DC	25 - 75	15 - 25

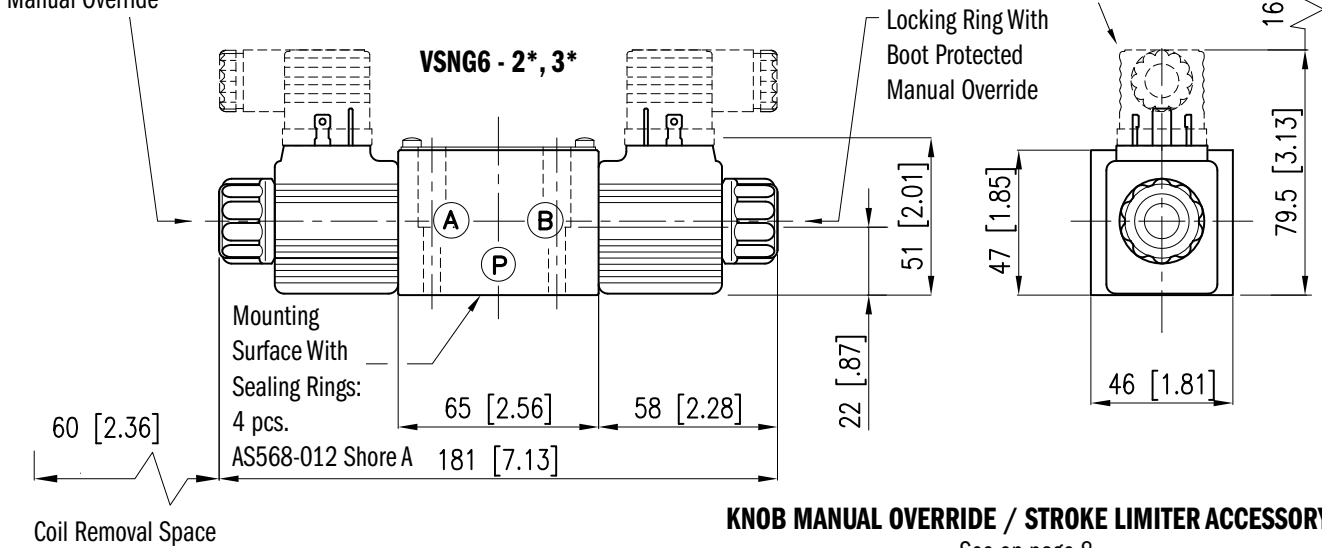
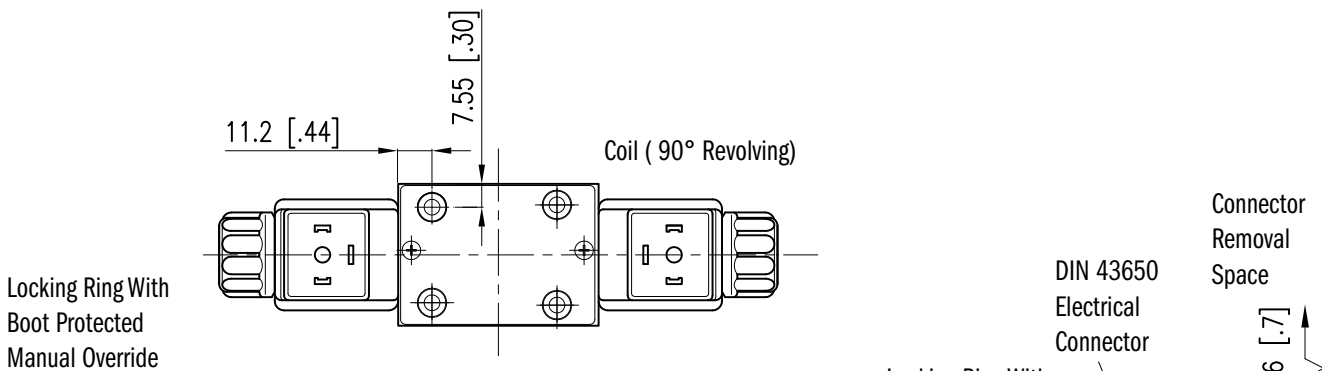
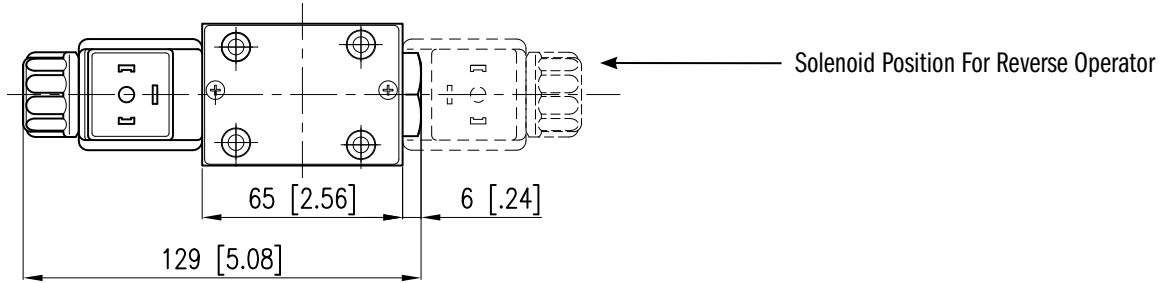
### NOTE:

Switching times obtained with 3A solenoid valve. The energizing time is obtained at the time the spool switches over. The de-energized time are measured at the time pressure variation occurs on the line.

# OVERALL AND MOUNTING DIMENSIONS

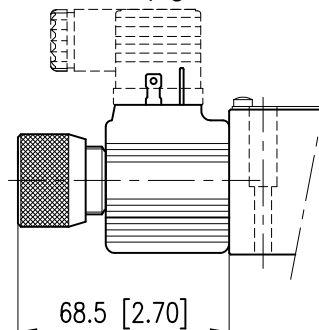
VSNG6 - 1\*, 5\*, 9

Dimensions in mm [IN]



## KNOB MANUAL OVERRIDE / STROKE LIMITER ACCESSORY



See on page 8.



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# COILS


## ORDERING CODE DC

**D**  

VOLTAGE	
<b>12</b>	12V DC
<b>24</b>	24V DC

CONNECTION	
<b>K1</b>	DIN 43650 - IP65
<b>K2</b>	AMP JUNIOR - IP67
<b>K4</b>	Lead Wires (1mt Length) - IP67
<b>K7</b>	DEUTSCH DT04 male - IP69K
<b>K8</b>	AMP SUPER SEAL IP69K

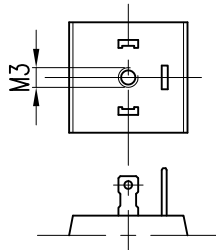
## ORDERING CODE - RECTIFIED

**R**  **K1**

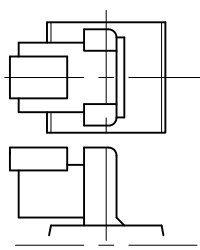
VOLTAGE	
<b>120</b>	120V DCR
<b>230</b>	230V DCR

CONNECTION	
<b>K1</b>	DIN 43650 - IP65

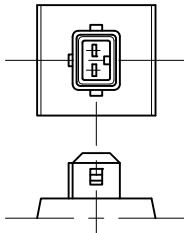
**K1**



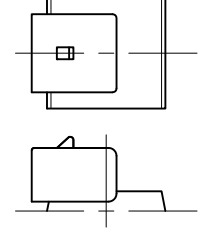
**K7**



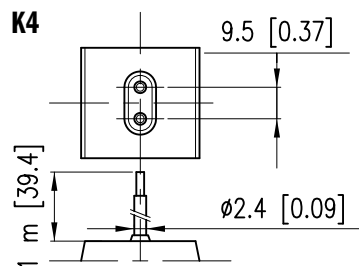
**K2**



**K8**



**K4**



<b>SUPPLY VOLTAGE FLUCUATION</b>		± 10% Vnom
<b>MAXIMUM SWITCH ON FREQUENCY</b>		10,000 cycles/hr
<b>DUTY CYCLE</b>		100%
<b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b>		According to 2004/108/EC
<b>LOW VOLTAGE</b>		According to 2006/95 EC
<b>CLASS OF PROTECTION</b>	Coil Insulation	Class H
	Impregnation	Class H

## CURRENT CONSUMPTION

	RESISTANCE AT 68°F [Ω] (±1%)	CURRENT CONSUMPTION [A] (±5%)	POWER CONSUMPTION (±5%)	
			[W]	[VA]
<b>D12</b>	5.4	2.2	26.5	
<b>D24</b>	20.7	1.16	27.8	
<b>R120</b>	363	0.25		27.2
<b>R230</b>	1640	0.11		26.4

The coils are fastened to the tube by a threaded nut and can be rotated 360°.

'R' rectified coils must be used when the valve is fed with AC power supply subsequently rectified by means of rectifier bridge. Continental Hydraulics offers DIN43650 connectors with a built-in rectifier bridge. Refer to VEA-6FR on page 6. One is required per solenoid.

The interchangeability of coils of different voltages is allowed within the same type of supply current, alternating or direct.

The protection degree is IEC EN 60529 compliant. It's guaranteed only with the connector correctly connected and installed. Coils are supplied without connectors.

# APPLICATION DATA

## FLUIDS

All pressure drops shown on these data pages are based on 170 SUS fluid viscosity and 0.87 specific gravity. For any other specific gravity (G1) the pressure drop ( $\Delta P$ ) will be approx.  $\Delta P_1 = \Delta P (G1/G)$ . See the chart for other viscosities.

<b>FLUID VISCOSITIES</b>	Cst	10	14.5	32	36	43	54	65	76	86	108	216	324	400
	SUS	60	75	150	170	200	250	300	350	400	500	1000	1500	1900
<b>MULTIPLIER</b>		0.77	0.81	0.97	1.00	1.04	1.10	1.15	1.20	1.24	1.31	1.56	1.72	1.83

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals. For fluids HFDR type (phosphate esters) use FPM seals (code V). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 176 °F causes a faster degradation of the fluid and of the seals characteristics.

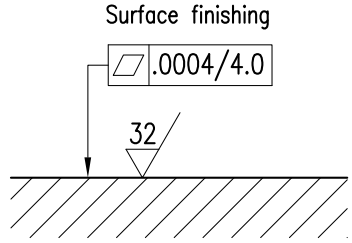
The fluid must be preserved in its physical and chemical characteristics.

<b>RANGE TEMPERATURES:</b>	Ambient	-4 to +130 °F	-20 to +54 °C
	Fluid	-4 to +180 °F	-20 to +82 °C
<b>FLUID VISCOSITY</b>	Range	60 -1900 SUS	10 - 400 cSt
	Recommended	120 SUS	25 cSt
<b>FLUID CONTAMINATION</b>	ISO 4406:1999 Class 20/18/15		

## INSTALLATION

The configurations with centering and return springs can be mounted in any position. Valve fitting takes place by means of bolts or stud kits, fixing the valve on a lapped surface, with values of planarity and smoothness that are equal to or better than those indicated in the drawing. If the minimum values of planarity or smoothness are not met, fluid leakages between valve and mounting surface can easily occur.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed, fluid can easily leak between the valve and support surface.



**DIN 43650 CONNECTORS**

ISO 4400 (Form A) 90°

<b>VEA-3E</b>	Gray 'A' Solenoid	165639
<b>VEA-3F</b>	Black 'B' Solenoid	165638
<b>VEA-6FR</b>	Black - With Built-in Graetz Bridge Rectifier Suitable for A and B Solenoids	1008400

**KNOB MANUAL OVERRIDE / STROKE LIMITER**

This dual-purpose device is an adjustable stop that may be utilized to position and hold the spool shifted. It may also be used to limit spool travel and regulate flow to the discharge port.

This device is ordered separately with the following code: **VMA-2A-A**

**BOLT/STUD KITS**

<b>BD03-125</b>	Valve only	1008406
<b>BD03-317</b>	Valve + (1) 40mm Stack	1008408
<b>BD03-474</b>	Valve + (2) 40mm Stack	1008409
<b>BD03-631</b>	Valve + (3) 40mm Stack	1008410

**NOTE:**

1. Bolt Kit Consists Of: 4 pcs. 10-24NC Fasteners  
4 pcs. #10 Lock Washer
2. Stud Kit Consists Of: 4 pcs. 10-24NC Studrods  
4 pcs. #10 Lock Studnuts
3. Tightening Torque: 5 - 7 Nm [ 4 - 5 lb.ft ]

**SEAL KIT**

<b>VSNG6 BUNA SEAL KIT</b>	1008577
<b>VSNG6 VITON SEAL KIT</b>	1012888





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ACCURATE  
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