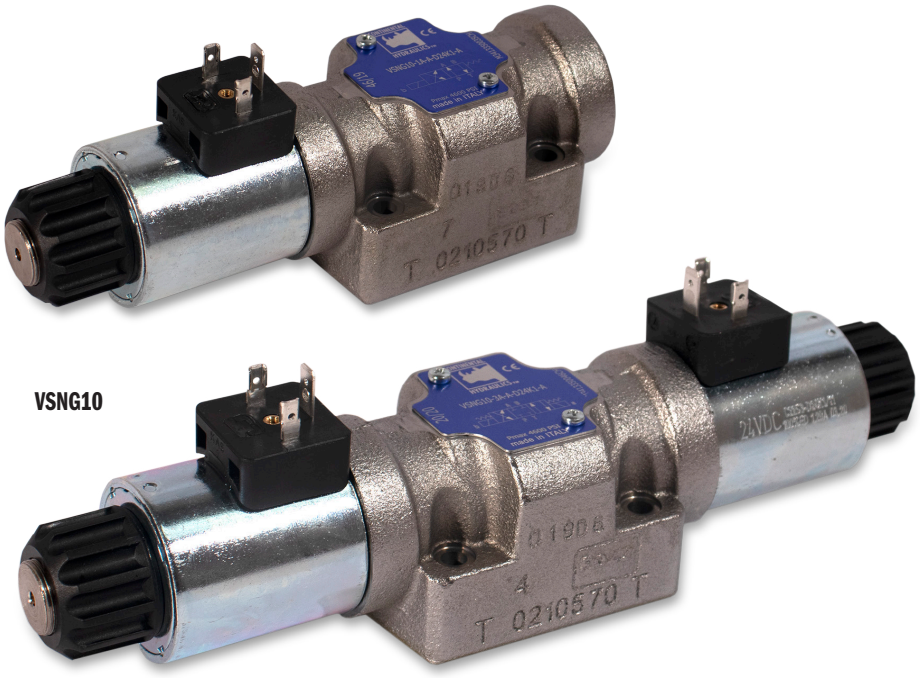
VSNG10

Solenoid Operated Directional Valve

SUBPLATE MOUNTING ISO 4401-05

P max **4600 PSI 320 bar**
Q max **33 GPM 125 l/min**



VSNG10

► DESCRIPTION:

These valves are supplied with a ZINC-NICKEL PLATING making them the perfect choice for mobile and environmental applications that require better protection.

Direct acting, subplate mounted directional control valve, with mounting surface according to NFPA D05 ISO 4401-05. The valve body is made with high strength cast iron with internal passages designed to minimize pressure drop

OPERATIONS

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

DIN 43650, DEUTSCH DT04-2P coil connections available.

Salt spray resistance up to 600h (test according to UNI EN ISO 9227 and UNI EN ISO 10289 tests and standards).

► PERFORMANCE:

Max Operating Pressure:	P - A - B Ports	4600 psi	320 bar
	T Ports	3000 psi	210 bar
Flowrate		33 gpm	125 l/min
Mounting Surface		NFPA D05 ISO 4401-05-04-0-05	
Maximum Weight	Single Solenoid	4.63 lbs	2.1 kg
	Dual Solenoid	5.95 lbs	2.7 kg
Temperature Range	Ambient	-4 to +130°F	-20 to +54°F
	Fluid	-4 to +180°F	-20 to +82°F
Fluid Viscosity	Range	60-1900 SUS	10-400 cSt
	Recommended	120 SUS	25 cSt
Fluid Contamination Degree		ISO 4406:1999 Class 20/18/15	

(Obtained with mineral oil with viscosity of 36 cSt at 50°C and electronic control card)

► IDENTIFICATION CODE:

VSNG10 - [ ] - [ ] [ ] [ ] - [ ] - [ ] ——— DESIGN LETTER

BASIC VALVE FUNCTIONS / SPOOL CODES
see page 3

SEAL TYPE	
CODE	**DESCRIPTION**
A	BUNA
G	VITON

MECHANICAL (SELECT 1)	
CODE	**DESCRIPTION**
OMIT	No options
R	Single Solenoid - B port end
(See page 5 for more details)	

OVERRIDE OPTIONS (SELECT 1)	
CODE	**DESCRIPTION**
OMIT	No options
U	Manual Override Boot
CP	Push Knob (DC only)
CK1	Turn Knob (DC only)
CPK	Mechanical Detent (DC only)
For applications requiring a higher IP rating, one of the above codes will be required. (See page 8 for more details)	

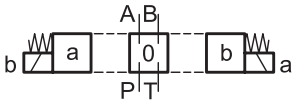
VOLTAGE / CONNECTION		
CODE	**DESCRIPTION**	**CONNECTION TYPE**
DC Voltages		
D12WK1	12 VDC	DIN 43650 (Form A) Zinc-Nickel coating
D12WK7	12 VDC	Deutsch DT04-2P Zinc-Nickel coating
D12WK7D	12 VDC	Deutsch DT04-2P Bi-Directional Diode Zinc-Nickel coating
D14K1	14 VDC	DIN 43650 (Form A)
D24WK1	24 VDC	DIN 43650 (Form A) Zinc-Nickel coating
D24WK7	24 VDC	Deutsch DT04-2P Zinc-Nickel coating
D24WK7D	24 VDC	Deutsch DT04-2P Bi-Directional Diode Zinc-Nickel coating
D28K1	28 VDC	DIN 43650 (Form A)
D48K1	48 VDC	DIN 43650 (Form A)
D110K1	110 VDC	DIN 43650 (Form A)
D125K1	125 VDC	DIN 43650 (Form A)
D220K1	220 VDC	DIN 43650 (Form A)

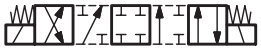
TYPICAL ORDERING CODE:
VSNG10-3A-G-D24WK1-B

Please see Connectors Catalog
Form #1027453

▶ FUNCTIONS/SPOOL CODES:

2 solenoids
3 positions with spring centering



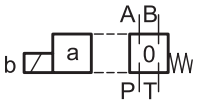
3A


3B


3F


3L


1 solenoid side A
2 positions (central + external)
with spring centering



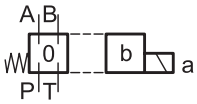
5A


5B


5F


5L


1 solenoid side B
2 positions (central + external)
with spring centering



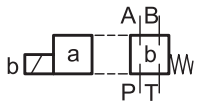
5A*R


5B*R


5F*R


5L*R

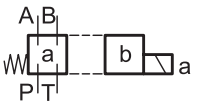

1 solenoid side A
2 external positions with
return spring



1A


1B

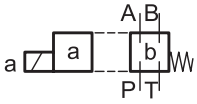

1 solenoid side B
2 external positions with
return spring



1A*R

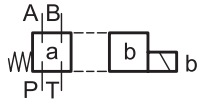

1B*R


1 solenoid side A
2 positions with return spring



9X

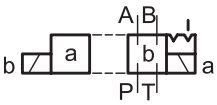

1 solenoid side B
2 positions with return spring



9X*R


Besides the diagrams shown, which are the most frequently used, other special versions are available: consult our technical department for their identification, feasibility and operating limits.

2 solenoids
2 positions with mechanical retention



2A


SWITCHING TIMES

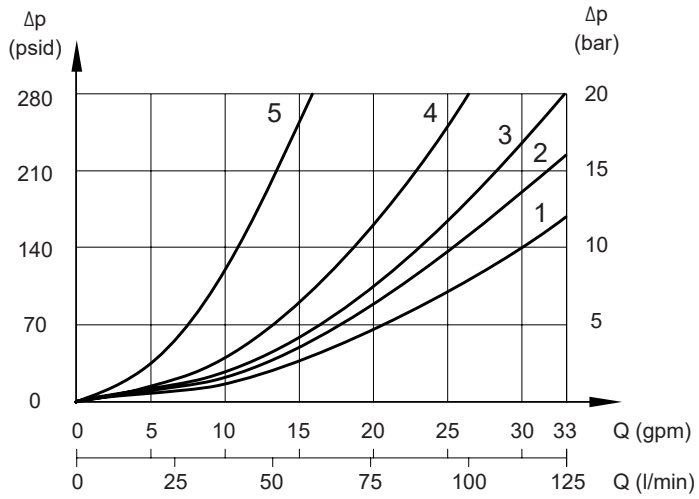
Switching times obtained with 3A solenoid valve. The energizing time is obtained at the time the spool switches over. The de-energizing time is measured at the time the pressure variation occurs on the line.

TIMES (± 10%) [MS]	
ENERGIZING	DE-ENERGIZING
70 - 100	15 - 20

▶ PERFORMANCE DATA:

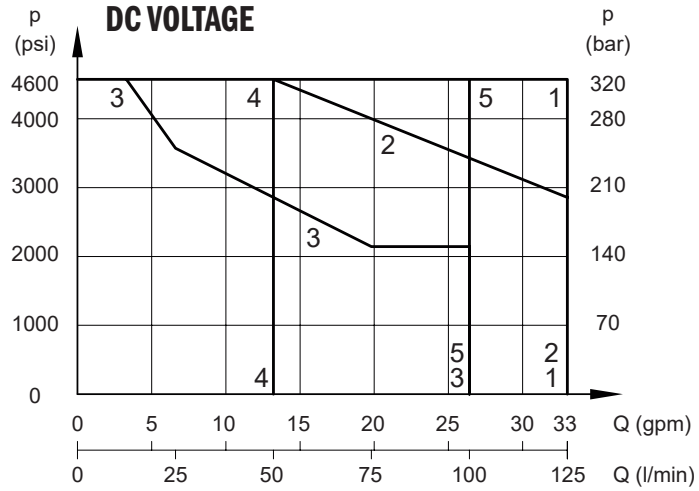
PRESSURE DROPS Δp-Q

(obtained with viscosity 170 SUS - 26 cSt at 122°F - 50°C)



SPOOL TYPE	FLOW DIRECTION					
	SHIFTED				CENTER	
	P → A	P → B	A → T	B → T	P → T	A → T B → T
3A, 5A	1	1	2	2		
3B, 5B	1	1	1	1	1	5
3F, 5F	1	1	1	1		
3L, 5L	4	4	4	4	1	
2A	2	2	2	2		
1A	2	2	3	3		
1B	2	2	1	1		
9X	3	3				

DC VOLTAGE

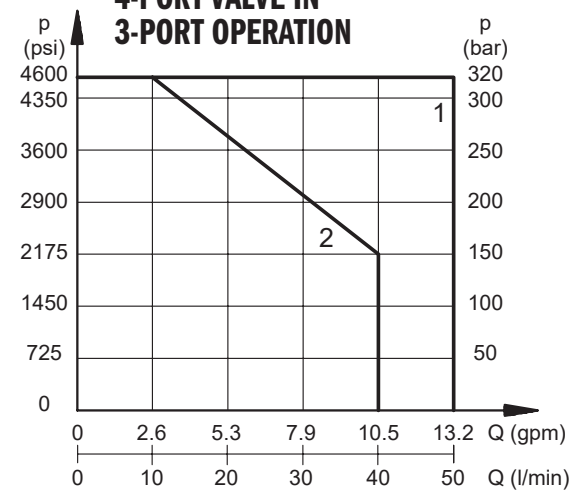


CURVE	SPOOL
1	3A, 3B, 2A
2	1B
3	3F
4	3L
5	1A, 9X

NOTES:

1. The values indicated in the graphs are relevant to the standard solenoid valve, with D24 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 values have been obtained with filtration according to ISO 4406:1999 class 18/16/13.

4-PORT VALVE IN 3-PORT OPERATION



Operating limits of a 4-port valve in 3-port operation or with port A or B plugged or without flow.

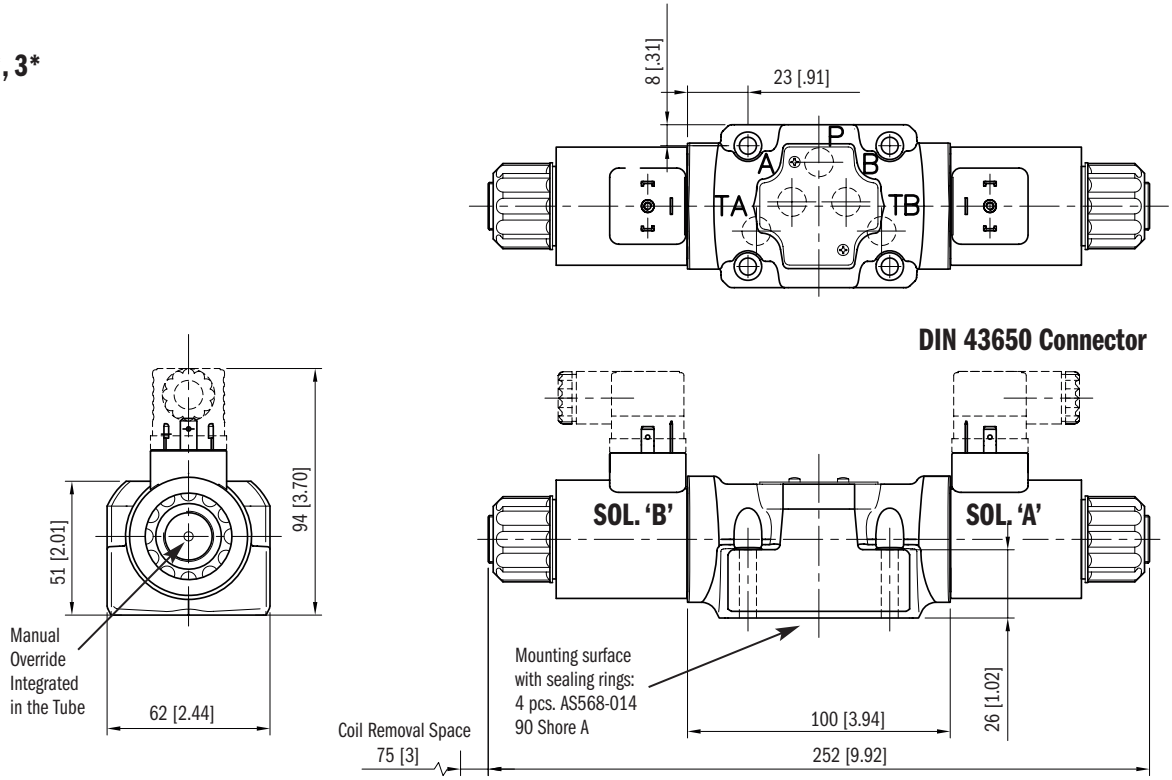
SPOOL	CURVE
1A	1
1B	2

► INSTALLATION DATA:

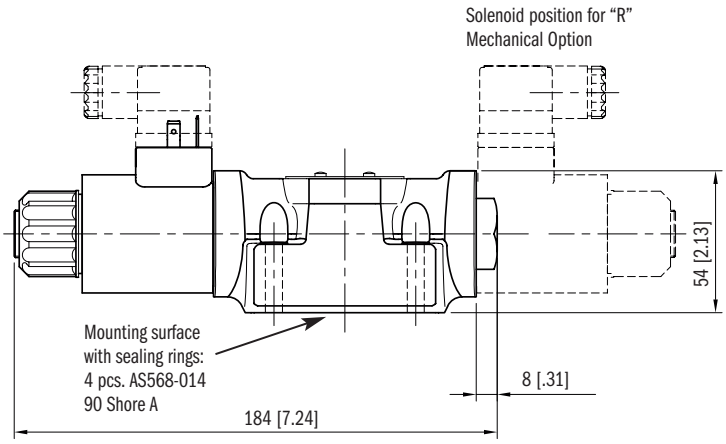
Dimensions mm [in]

OVERALL AND MOUNTING DIMENSIONS - DIN STYLE VERSION

VSNG10-2*, 3*



VSNG10-1*, 5*, 9X



► ELECTRICAL:

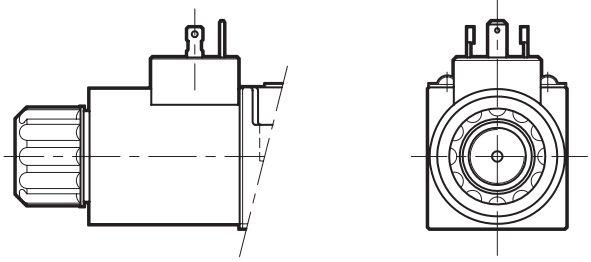
CONNECTIONS

See Connectors and Cable Sets Catalog (1027453) for all available connection styles.

Dimensions mm [in]

Connection for EN 175301-803
(ex DIN 43650) connector

code WK1 (DC voltage version only)



Connection for
DEUTSCH DT06-2S male connector

code WK7

code WK7D (with diode)

Solenoids

These are essentially made up of two parts: tube and coil. The tube is threaded into the valve body and includes the armature that moves immersed in oil, without wear. The inner part, in contact with the oil in the return line, ensures heat dissipation. The coil is fastened to the tube by a threaded ring, and can be rotated 360°, to suit the available space.

NOTE: In order to further reduce the emissions, with DC supply, use of type H connectors is recommended. These prevent voltage peaks on opening of the coil supply electrical circuit.

SUPPLY VOLTAGE FLUCTUATION	± 10% Vnom
MAX SWITCH ON FREQUENCY	18.000 ins/hr
DUTY CYCLE	100%
ELECTROMAGNETIC COMPATIBILITY (EMC) (NOTE)	In compliance with 2014/30/EU
LOW VOLTAGE	In compliance with 2014/35/EU
CLASS OF PROTECTION: **Coil insulation (VDE 0580)** **Impregnation: DC valve**	 class H class F

► ELECTRICAL:

Protection from atmospheric agents IEC 60529

The IP protection degree is guaranteed only with both valve and connectors of an equivalent IP degree, correctly connected and installed.

Electric Connection Code	Electric Connection Protection	Whole Valve Protection
K1	IP65	IP65
WK1	IP66	IP66
WK7	IP66/IP68/IP69 IP69K*	IP66/IP68/IP69 IP69K*
WK7D	IP66/IP68/IP69 IP69K*	IP66/IP68/IP69 IP69K*

(*) The IP69K protection degree is not taken in account in IEC 60529 but is included in ISO 20653.

Current and absorbed power for DC solenoid valves

The coils WK feature a zinc-nickel surface treatment.

The WK7D coil includes a bi-directional diode for protection from voltage peaks during switching. During the switching the diode significantly reduces the energy released by the winding, but limiting the voltage to 31.4 V in the D12 coil and to 58.9 V in the D24 coil.

Using connectors type “D” (VEA-6FR) with embedded bridge rectifier it is possible to feed DC coils (starting from 48V voltage) with alternating current (50 or 60 Hz), considering a reduction of the operating limits (see page 6).

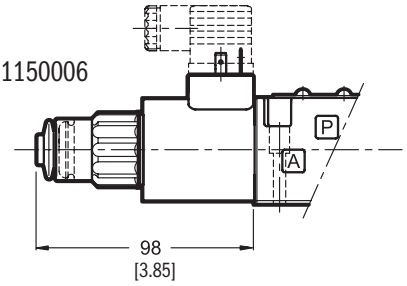
Code	Nominal Voltage [V]	Resistance at 20 °C [Ω]	Current Consumption [A]	Power Consumption [W]	Replacment Coil Code
D12WK1	12	4.4	2.72	32.7	M3984000001
D12WK7	12	4.4	2.72	32.7	M3984000101
D12WK7D	12	4.4	2.72	32.7	M3984000111
D14K1	14	7.2	1.93	27	M1903086
D24WK1	24	18.6	1.29	31	M3984000002
D24WK7	24	18.6	1.29	31	M3984000102
D24WK7D	24	18.6	1.29	31	M3984000112
D28K1	28	26	1.11	31	M1903082
D48K1	48	78.6	0.61	29.5	M1903083
D110K1	110	423	0.26	28.2	M1903464
D125K1	125	550	0.23	28.6	M1903467
D220K1	220	1692	0.13	28.2	M1903465

► MANUAL OVERRIDES:

Dimensions mm [in]

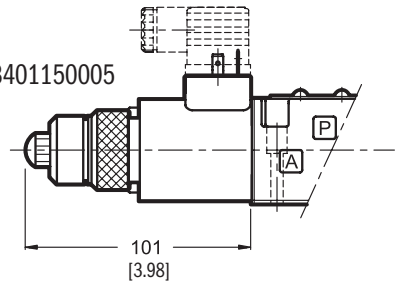
U Manual override, boot protected

Code: M3401150006



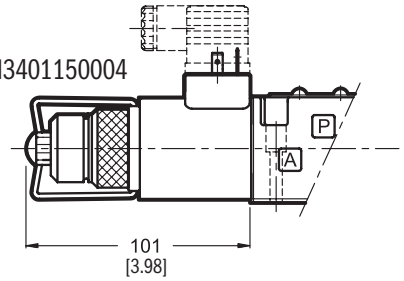
CP Push manual override

Code: M3401150005



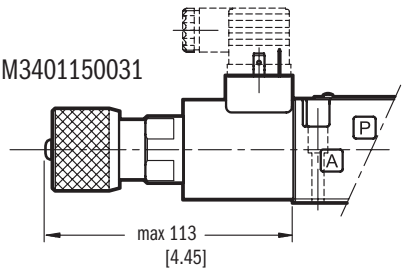
CPK Push manual override with mechanical retention

Code: M3401150004



CK1 Turning knob override

Code: M3401150031



► INSTALLATION DATA:

SEAL KIT

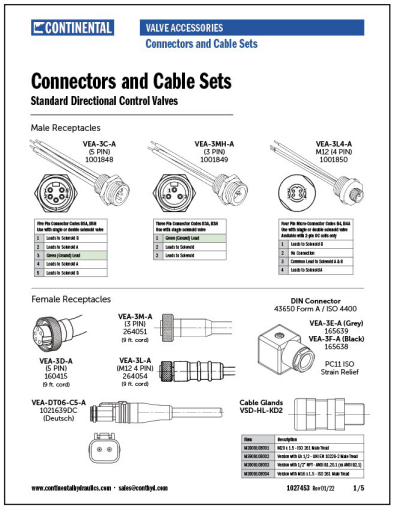
BUNA SEAL KIT	1019658
Viton Seal Kit	1030381

BOLT KIT

BD05-150-B	1019657

NOTES:

1. Bolt kit consists of: Qty. 4 1/4 - 20 UNC / Qty. 4 #1/4 Lock washer
2. The recommended torque value for fasteners is: 6 lbf (8 Nm)



Connectors and Cables Sets
Form #1027453

CONTINENTAL HYDRAULICS INC. / HYDRECO INC.

4895 12th Avenue East, Shakopee, Minnesota 55379

952.895.6400 • sales@conthyd.com • **www.continentalhydraulics.com**

704.295.7575 • sales-us@hydreco.com • **www.hydreco.com**