

CONTINENTAL



HYDRAULICS™

CONTINENTAL HYDRAULICS

VER*SPG

PROPORTIONAL PRESSURE RELIEF VALVES WITH OBE



VER*SPG - PROPORTIONAL PRESSURE RELIEF VALVES WITH OBE

VER*SPG

PROPORTIONAL PRESSURE RELIEF VALVES WITH OBE



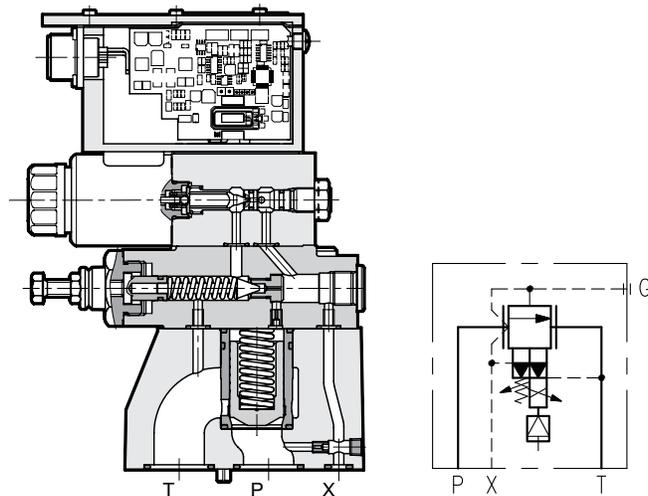
DESCRIPTION

VER*SPG valves are Proportional pilot operated pressure relief valves with On-board Digital amplifier for proportional pressure control and are subplate mounted according to NFPA T3.5.1 R2-2002 and ISO 6264:1998 standards.

Available in four proportional pressure ranges up to 5000 psi and in three nominal sizes for flow rates up to 132 gpm.

These valves are used to provide remote and variable pressure control in a hydraulic circuit. The pressure setting is directly proportional to the command input into the On-board Amplifier. In the event of a power failure, the valve will return to low pressure.

They have a built-in manual relief valve that is factory set to the maximum value of the pressure control range.



TYPICAL PERFORMANCE SPECIFICATIONS

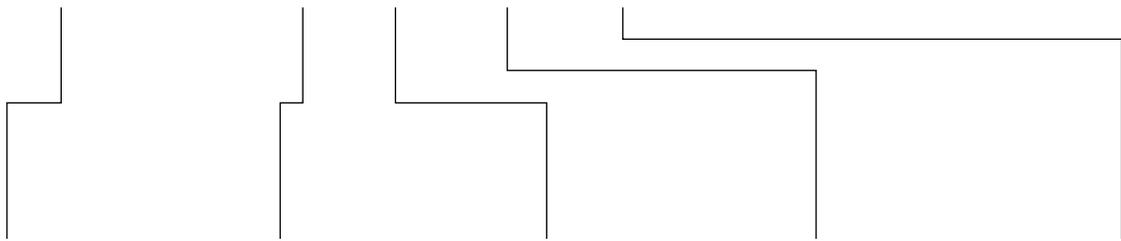
MAXIMUM OPERATING PRESSURE:		5000 psi	350 bar
MAXIMUM FLOW RATE	VER06SPG	53 gpm	200 l/min
	VER08SPG	105 gpm	400 l/min
	VER10SPG	132 gpm	500 l/min
MOUNTING SURFACE	VER06SPG	R06 NFPA - ISO 6264-06	
	VER08SPG	R08 NFPA - ISO 6264-08	
	VER10SPG	R10 NFPA - ISO 6264-10	
MAX WEIGHT	VER06SPG	12 lbs	5.5 kg
	VER08SPG	14 lbs	6.3 kg
	VER10SPG	18.7 lbs	8.5 kg

STEP RESPONSE @ 140 bar	0 → 100%	50 ms
	100 → 0%	30 ms
STEP RESPONSE @ 210 bar	0 → 100%	70 ms
	100 → 0%	40 ms
HYSTERESIS	% of p max	< 3%
REPEATABILITY	% of p max	< ± 1%
POWER SUPPLY		24V DC
CONNECTION		7 Pin DIN 43563 Metal
PROTECTION	IEC 60529	IP67

NOTE: Response times obtained with VER08SPG-140 and VER08SPG-210.

IDENTIFICATION CODE

VER **SPG** - - - - **D** - _____ DESIGN LETTER



SIZE	
06	NFPA R06
08	NFPA R08
10	NFPA R10

PRESSURE CONTROL RANGE	
070	Up to 1000 psi (up to 70 bar)
140	Up to 2000 psi (up to 140 bar)
210	Up to 3000 psi (up to 210 bar)
350	Up to 5000 psi (up to 350 bar)

SEAL	
A	Buna (STD)
G	Viton

CONNECTION	
K1	On board electronics 7 pin - no external enable required (STD)
K7	On board electronics 7 pin external enable on Pin C required

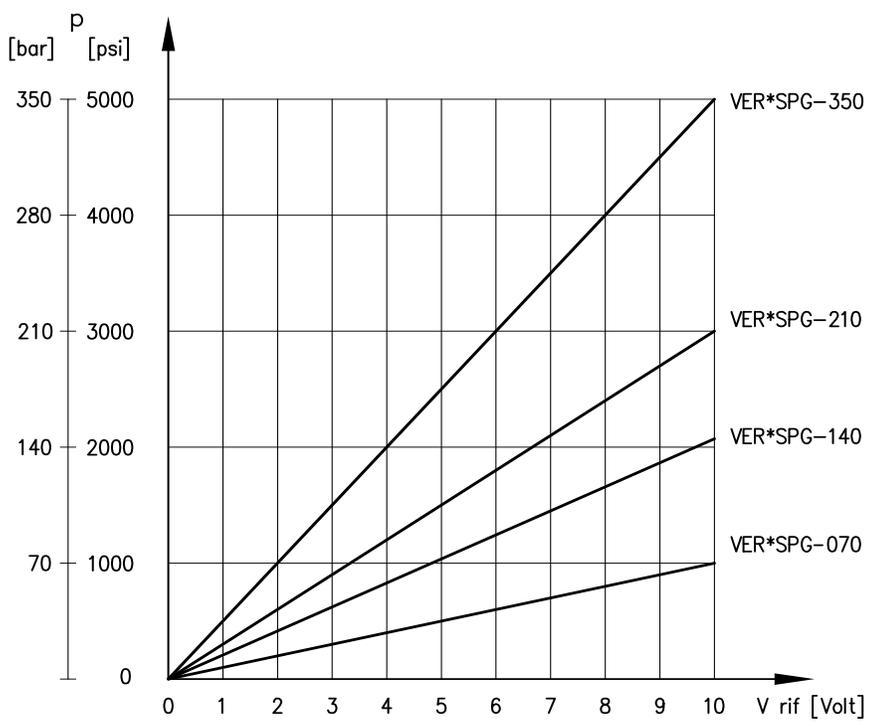
REFERENCE SIGNAL	
E0	Voltage ± 10V (STD)
E1	Current 4 - 20 mA

TYPICAL ORDERING CODE:
VER03SPG-210-A-OBW-E0D-A

CHARACTERISTIC CURVES

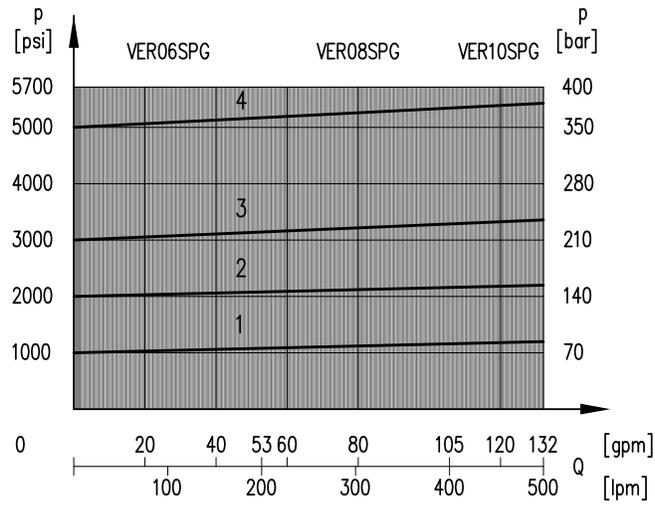
Curves obtained with mineral oil with viscosity of 170 sus (36 cSt) at 122°F (50°C).

PRESSURE GAIN



CHARACTERISTIC CURVES

ADJUSTMENT

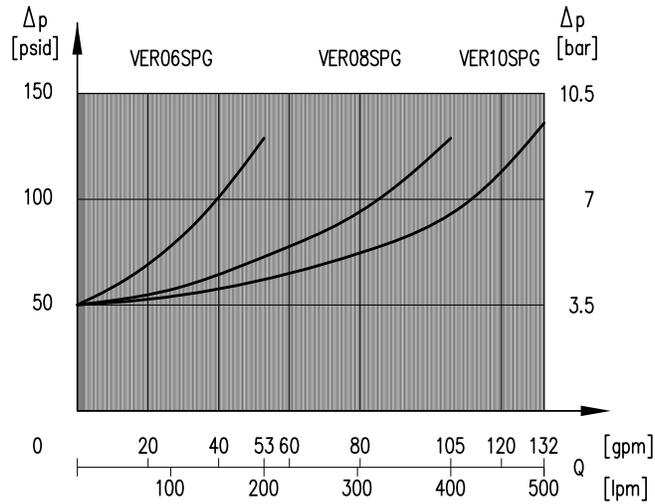


CURVE	PRESSURE RANGE
1	Up to 1000 psi
2	Up to 2000 psi
3	Up to 3000 psi
4	Up to 5000 psi

NOTES:

1. Values obtained with oil viscosity of 170 SUS (36 cSt) at 122°F (50°C).

PRESSURE DROPS



OVERALL AND MOUNTING DIMENSIONS FOR VER*SPG

SEALING RINGS:

VER06SPG

- 2 O-Ring 17.86mm ID x 2.62mm CS 90 Shore A
- 1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A

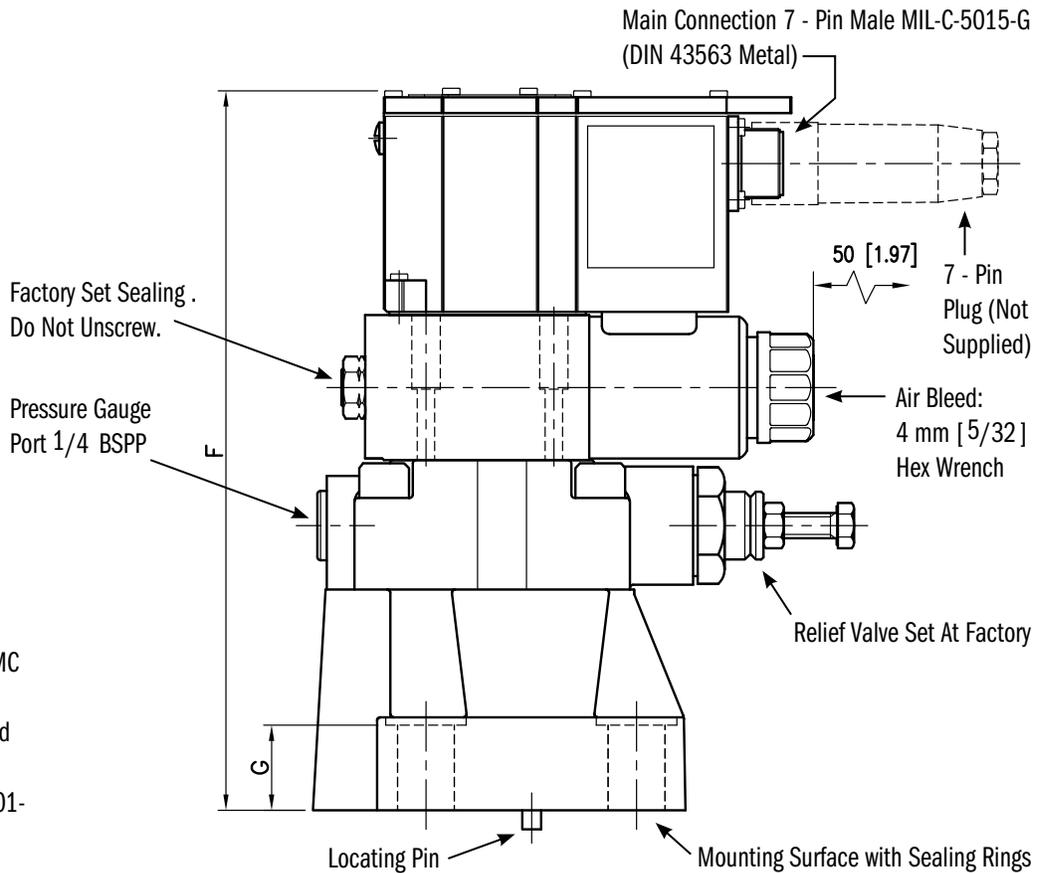
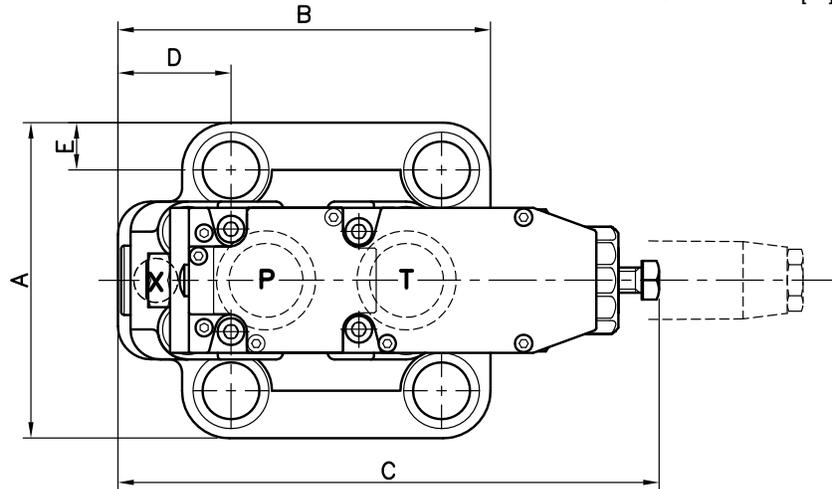
VER08SPG

- 2 O-Ring AS568-123 90 Shore A
- 1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A

VER10SPG

- 2 O-Ring AS568-220 90 Shore A
- 1 O-Ring 9.13mm ID x 2.62mm CS 90 Shore A

Dimensions in mm [IN]



In order to avoid electromagnetic noises and fulfill the European EMC regulations, a 7 pin metal plug according to MIL-C-5015 G should be used instead of the standard plastic 6+PE connector EN 175201-408 (formerly DIN 43563)

VALVE	DIMENSIONS mm [in]							FASTENING	
	A	B	C	D	E	F	G	n° 4 FASTENERS	TIGHTENING TORQUE
VER06SPG	80 [3.15]	80 [3.15]	179 [7.05]	13 [0.51]	13 [0.51]	186 [7.32]	22 [0.87]	M12x40 [½ -13 UNC x 1½"]	50.9 lb.ft
VER08SPG	100 [3.94]	118 [4.64]	170 [6.69]	36 [1.42]	15 [0.59]	196 [7.72]	27 [1.06]	M16x50 [5/8 -11 UNC x 2"]	125.3 lb.ft
VER10SPG	120 [4.72]	152 [5.98]	180 [7.09]	44 [1.73]	19 [0.74]	206 [8.11]	35 [1.38]	M18x60 [¾ -10 UNC x 2.5"]	173.3 lb.ft



ELECTRICAL CHARACTERISTICS

The proportional valve is controlled by a digital amplifier (driver), which incorporates a microprocessor that controls all the valve functions.

THE STANDARD VALVE IS SET AT THE FACTORY WITH:

- UP/DOWN ramp at zero value
- No deadband compensation
- Max valve pressure setting (100% of pressure control range).

It is possible to customize these and others parameters using the optional kit, VEA-PB5 or VEA-PB7 to be ordered separately (see related literature).

THE DIGITAL DRIVER ENABLES THE VALVE TO REACH BETTER PERFORMANCE COMPARED TO THE ANALOG VERSION, AND GIVES:

- Reduced response times
- Optimization and reproducibility of the characteristic curve, optimized in factory for each valve
- Complete interchangeability in case of valve replacement
- Opportunity to set, via software, the functional parameters
- Opportunity to perform a diagnostic program by means of the LIN connection
- High immunity to electromagnetic interference

The electronic card is available with (OBC) or without (OBW) external enabling signal feature.

POWER SUPPLY		24V DC (19V to 35V, ripple max 3Vpp)
ABSORBED POWER		50 W
MAX CURRENT		2A
DUTY CYCLE		100%
MAIN CONNECTOR		7 pin MIL-C-5015-G (DIN 43563)
ELECTROMAGNETIC COMPATIBILITY (EMC) EUROPEAN DIRECTIVE 2004/108/CE	Emission	IEC EN 61000-6-4
	Immunity	IEC EN 61000-6-2
PROTECTION AGAINST ATMOSPHERIC AGENTS	IEC 60529	IP 67
ELECTRICAL PROTECTION	Overload electronics overheating power failure or < 4mA	

E0 - VOLTAGE

COMMAND SIGNAL (DIFFERENTIAL)	0 - 10V DC
IMPEDANCE	> 50 kΩ

E1 - CURRENT

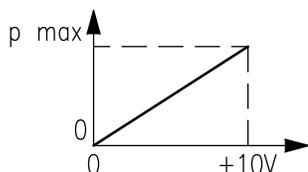
COMMAND SIGNAL	4 - 20 mA
IMPEDANCE	500 Ω

E0 VERSION - VOLTAGE REFERENCE SIGNAL

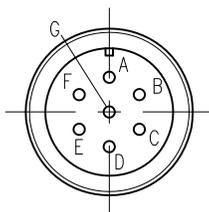
This is the most common version; it makes the valve completely interchangeable with the traditional proportional valves with analogue type integrated electronics. The valve has only to be connected as indicated below.

The input signal is differential type and drives the valve as shown in the graph. The pressure output is proportional to UD - UE.

If only one input signal (single-end) is available, the pin B (0V power supply) and the pin E (0V reference signal) must be connected through a jumper and both connected to GND, electric panel side.



A	24V	Power supply positive. Use an external fuse 5A/50V fast type for protecting electronics.
B	0V	Power supply zero (0V)
C	NC or 24V	OBW Version: Not wired OBC Version: Valve enable
D	± 10V or 0 - 10V	Differential command signal (+V)
E	0V	Differential command signal (-V)
F	0 - 10V	Output monitor for command signal
G	GND	Protective ground



WIRING

Connections must be made via the 7 pin plug mounted on the amplifier.

RECOMMENDED CABLE SIZES ARE:

POWER SUPPLY

18 AWG (0.75 mm²)
for cables up to 65 ft (20 m)

16 AWG (1.00 mm²)
for cables up to 130 ft (40 m)

SIGNAL CABLES

20 AWG (0.50 mm²)

A suitable cable would have 7 wires, a separate shield for the signal wires and an overall shield.

PIN C:

Pin C is reserved for the Enable feature and is not connected on the standard card (OBW, see code at page 3) because the enable signal is run directly from the card.

With OBC card, the Enable feature is external, Pin C has to be connected with 24V.

PIN F:

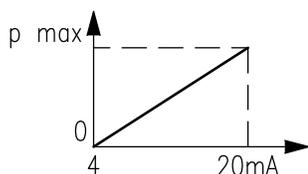
For reading this value as current monitor signal, the card must be energized. This value has to be read on Pin B (0V).

A value of 10V means a current to the solenoid at 100% rated.

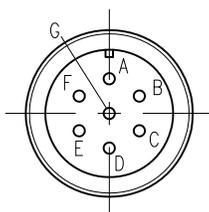
Pin F	Pin D	
	E0	E1
-	-	-
6V	0V	4mA
+10V	+10V	20mA

E1 VERSION - CURRENT REFERENCE SIGNAL

The current reference signal is supplied in range of 4 - 20 mA and drives the valve as shown in the chart below. If the current drops to less than 4 mA, the card de-energizes the coils and the valve will go to rest position. The valve will restart when the command signal rises into the 4 - 20 mA range.



A	24V	Power supply positive. Use an external fuse 5A/50V fast type for protecting electronics.
B	0V	Power supply zero (0V)
C	NC or 24V	OBW Version: Not wired OBC Version: Valve enable
D	4 - 20 mA	Command signal 4 - 20 mA
E	0V	Return
F	0 - 10V	Output monitor for command signal
G	GND	Protective ground



OBW OR OBC VERSION?

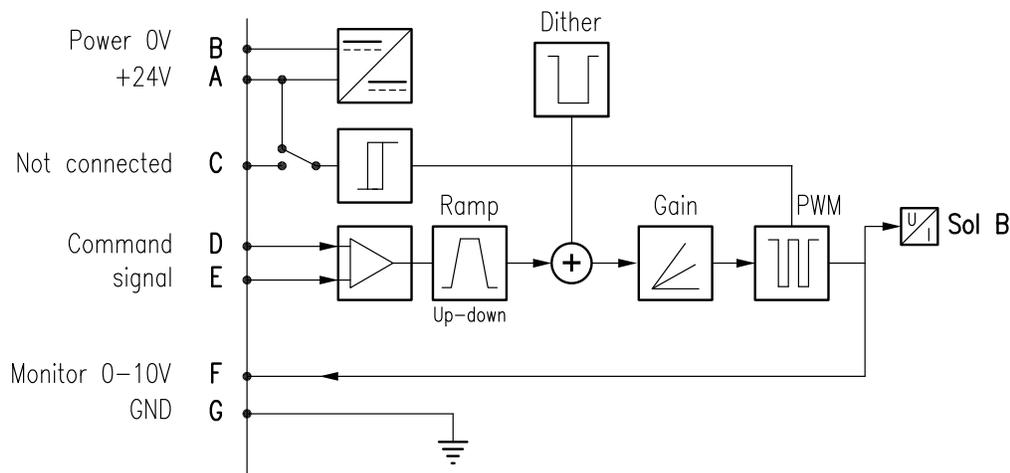
The standard option, code OBW, is programmed for internal enable. The enable signal is taken directly from the power supply of the valve. The card is enabled as soon as supply power is applied to Pins A and B.

Apply command signal to the valve and the output drivers energize the coil. The power supply must be switched off to disable the output to the valve.

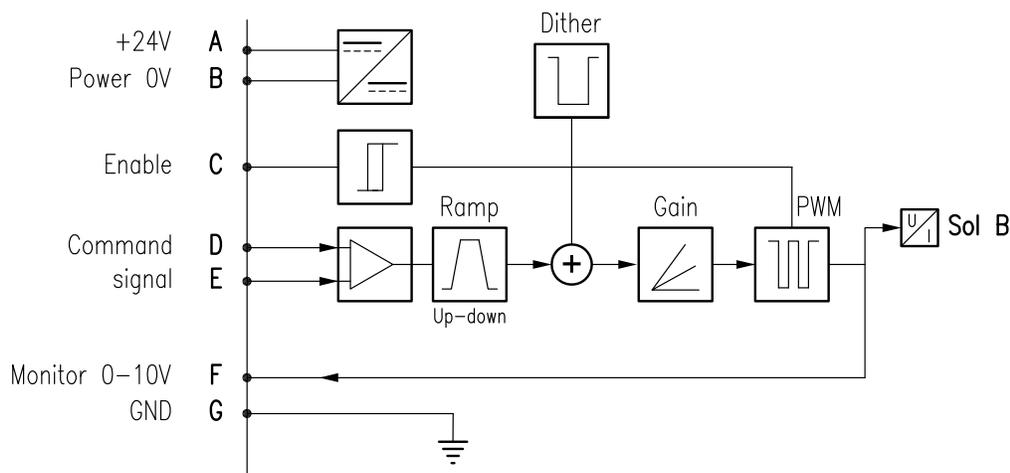
The OBC option is programmed for the external enable feature. A 24 V signal must be applied to Pin C to enable the output drivers to energize the valve coils.

The valve operation can be stopped by simply removing the enable signal from Pin C.

OBW CARD VERSION (STD)



OBC CARD VERSION



MOUNTING SURFACES

All the mounting surfaces refer to ISO 6264:1998 and NFPA T3.5.1 R2-2002 standards.

The mounting surface standards recommends metric coarse threads. However, subplates are commercially available with UNC threads. Select a bolt size that matches the threads in the mounting surface.

Dimensional tolerances are ± 0.1 mm (0.004") for bolt and pin location; ± 0.2 mm (0.008") for the other quotes.

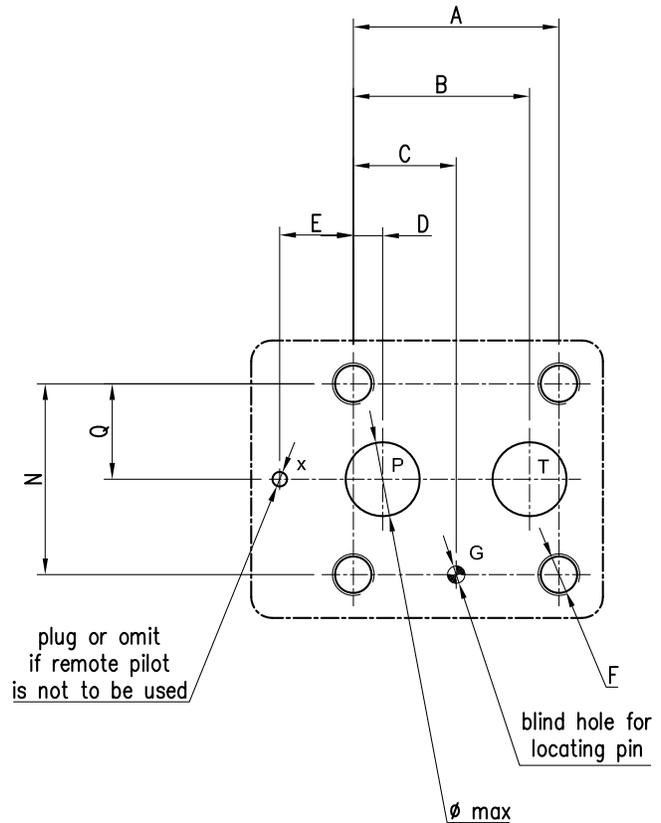
The minimum depth of the blind hole G is 8 mm (0.31 in).

PORT FUNCTION:

P = Pressure Inlet

T = Outlet To Reservoir

X = Remote Pilot Control Port



VALVE SIZE	MOUNTING SURFACE		DIMENSIONS mm [in]						
	NFPA	ISO	A	B	C	D	E	N	Q
06	R06	6264-06-09-0-97	53.8 [2.12]	47.5 [1.87]	22.1 [0.87]	22.1 [0.87]	0	53.8 [2.12]	26.9 [1.06]
08	R08	6264-08-13-0-97	66.7 [2.63]	55.6 [2.19]	33.4 [1.31]	11.1 [0.44]	23.8 [0.94]	70 [2.75]	35 [1.38]
10	R10	6264-10-17-0-97	88.9 [3.50]	76.2 [3.00]	44.5 [1.75]	12.7 [.50]	31.8 [1.25]	82.6 [3.25]	41.3 [1.63]

VALVE SIZE	MOUNTING SURFACE		DIMENSIONS mm [in]					F
	NFPA	ISO	Øp max	Øt max	Øx	Øg		
06	R06	6264-06-09-0-97	14.7 [0.58]	14.7 [0.58]	4.8 [0.19]	7.5 [0.295]	M12x40 [½ - 13 UNC x 1 ½"]	
08	R08	6264-08-13-0-97	23.4 [0.92]	23.4 [0.92]	6.3 [0.25]	7.5 [0.295]	M16x50 [¾ - 11 UNC x 2"]	
10	R10	6264-10-17-0-97	32 [1.26]	32 [1.26]	6.3 [0.25]	7.5 [0.295]	M18x60 [¾ - 10 UNC x 2.5"]	

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 (ΔP) will be approx. $\Delta P1 = \Delta P (G1/G)$. See the chart for other viscosities.

FLUID VISCOSITIES	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
MULTIPLIER		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 G). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 180 degrees F causes the accelerated degradation of seals as well as degradation of the fluids physical and chemical properties.

From a safety standpoint, temperatures above 130 degrees F are not recommended.

RANGE TEMPERATURES:	Ambient	- 4 to +130 °F	-20 to +54 °C
	Fluid	- 4 to +180 °F	-20 to +82 °C
FLUID VISCOSITY	Range	60 -1900 SUS	10 - 400 cSt
	Recommended	120 SUS	25 cSt
FLUID CONTAMINATION	ISO 4406:1999 Class 18/16/13		

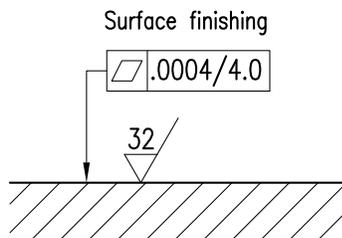
INSTALLATION

We recommend the VER*SPG valve be installed either horizontally or vertically with the solenoid downward. The minimum regulated pressure may vary from the graphs shown on page 3 if the valve is installed vertically with the solenoid upwards.

Bleed the air from the hydraulic circuit. Be sure that the solenoid tube is always full of oil. It may be necessary to vent trapped air from the solenoid tube in certain applications or after a long shutdown period. The air bleed vent is located on the end of the solenoid tube. See page 4 for the location. Be sure to close the air bleed when the process is complete.

Connect the valve T port directly to the tank. Any back pressure from the tank line will add directly to the controlled pressure. **The maximum allowable back pressure in the tank line under operational conditions is 2 bar.**

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.



SEAL KIT FOR VER*SPG

	VER06SPG	VER08SPG	VER10SPG
BUNA SEAL KIT	1013206	1013208	1013210
VITON SEAL KIT	1013207	1013209	1013211

BOLT KITS

VER06SPG	BR06-175	1/2-13 UNC x 1 1/2"	1013240
VER08SPG	BR08-200	5/8-11 UNC x 2"	1013241
VER10SPG	BR10-250	3/4-10 UNC x 2.5"	1013242

NOTES:

Bolt Kits consist of Qty 4 bolts and Qty 4 Lock washers

SUBPLATES

R06 SIZE	AR06SPS12S	Aluminum	SAE-12	1013128AB
	DR06SPS12S	Ductile	SAE-12	1013128AC
PR08 SIZE	AR08SPS16S	Aluminum	SAE-16	1013128AD
	DR08SPS16S	Ductile	SAE-16	1013128AE
PR10 SIZE	AR10SPS24S	Aluminum	SAE-24	1013128AF
	DR10SPS24S	Ductile	SAE-24	1013128AG

NOTES:

1. Max pressure for aluminum subplates: 3000 psi (210 bar)
2. Max pressure for ductile subplates: 5000 psi (350 bar)
3. Always verify subplate port size is proper for the application

POWERFUL
ACCURATE
INNOVATIVE
PRECISE
DURABLE
EFFICIENT
VERSATILE

ABOUT CONTINENTAL HYDRAULICS

Rugged, durable, high-performance, efficient—the reason Continental Hydraulics' products are used in some of the most challenging applications across the globe. With a commitment to quality customer support and innovative engineering, Continental's pumps, valves, power units, mobile and custom products deliver what the markets demand. Continental has been serving the food production, brick and block, wood products, automotive and machine tool industries since 1962. Learn how our products survive some of the most harsh environments.

SALES@CONTHYD.COM

5505 WEST 123RD STREET • SAVAGE, MN 55378-1299 / PH: 952.895.6400 / FAX: 952.895.6444 / WWW.CONTINENTALHYDRAULICS.COM

CONTINENTAL



HYDRAULICS.