CONTINENTAL HYDRAULICS

VER03MG
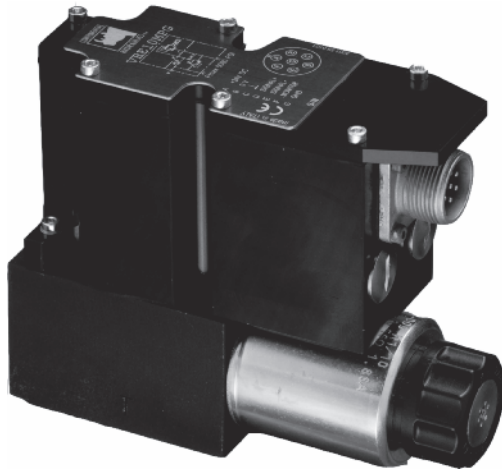
PROPORTIONAL PRESSURE RELIEF VALVES WITH OBE

CONTINENTAL
HYDRAULICS.

PRECISE

VER03MG

PROPORTIONAL PRESSURE RELIEF VALVES WITH OBE

DESCRIPTION

The VER03MG direct operated Proportional Relief Valve, with On-Board Digital Amplifier conforms to NFPA D03 / ISO 6264 standards.
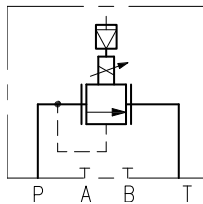
OPERATION

VER03MG valves are designed to control maximum pressure in low flow systems or as the proportional pressure pilot valve of larger two-stage pressure control valves.

Output pressure is controlled proportional to the input command reference signal supplied to the On-Board Digital Amplifier.

Four pressure ranges are available to help match your requirements.

The On-Board microprocessor controls all the valve functions and is preset to optimal valve performance. In field adjustments can be performed, via software, to customize the parameters based on your application needs.

TYPICAL PERFORMANCE SPECIFICATIONS

MAXIMUM OPERATING PRESSURE	P Port	5000 psi	350 bar
	T Port	30 psi	2 bar
MAX FLOW		0.8 gpm	3 l/min
RATED FLOW		0.26 gpm	1 l/min
PRESSURE STAGES	VER03MG-070	10 - 1000 psi	0.7 - 70 bar
	VER03MG-140	16 - 2000 psi	1.1 - 140 bar
	VER03MG-210	26 - 3000 psi	1.8 - 210 bar
	VER03MG-350	40 - 5000 psi	2.8 - 350 bar
MOUNTING SURFACE		NFPA R03 / D03 ISO 6264-03-04-*-97	
STEP RESPONSE @ 140 bar	0 →100%	40 ms	
	100 →0%	50 ms	
STEP RESPONSE @ 210 bar	0 →100%	70 ms	
	100 →0%	50 ms	
HYSTERESIS WITH PWM 200	% of p max	< 3%	
REPEATABILITY	% of p max	< ± 1%	
POWER SUPPLY		24V DC	
CONNECTION		7 pin DIN 43563 metal	
PROTECTION	IEC 60529	IP 67	
WEIGHT	Single Solenoid	4.4 lbs	2 kg

NOTE: Response times are at full rated pressure and an input flow rate of 0.53 gpm (2 l/min) with an oil volume under pressure of 0.13 gallons (0.5 liter). The response time is affected by flow rate and system capacitance.

IDENTIFICATION CODE

VER03MG - ☐ - ☐ - ☐ ☐ D - D ─────────

PRESSURE STAGES	
070	10 - 1000 psi (7-70 bar)
140	16 - 2000 psi (7-140 bar)
210	26 - 3000 psi (8-210 bar)
350	40 - 5000 psi (10-350 bar)

SEAL	
A	Buna (STD)
G	Viton

CONNECTION	
OBW	On board electronics - Internal Enable Monitor signal PIN F to PIN B
OBC	On board electronics - PIN C Enable Monitor signal PIN F to PIN B
OBM	On board electronics - Internal Enable Monitor signal PIN F to PIN C

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

TYPICAL ORDERING CODE:
VER03MPG-210-A-OBWE0D-D

CHARACTERISTIC CURVES

Typical control curves according to the current supplied to the solenoid for all the pressure stages, measured with input flow rate Q = 0.26 gpm (1 l/min). The curves are obtained after linearization in factory of the characteristic curves through the digital amplifier. They are measured without any back pressure in T.

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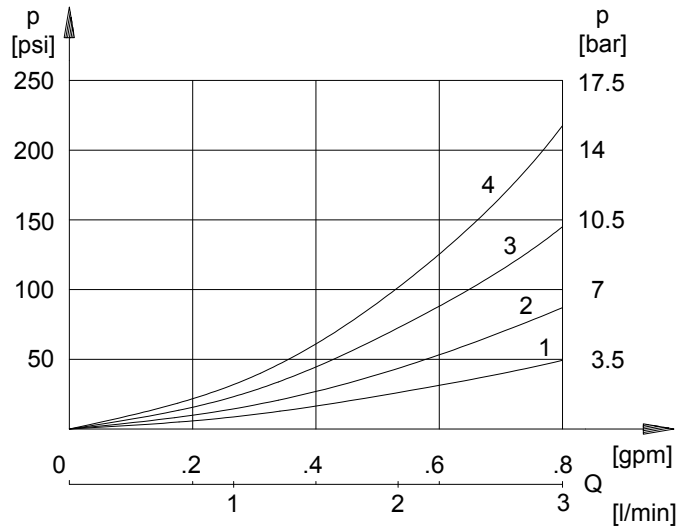
PRESSURE GAIN
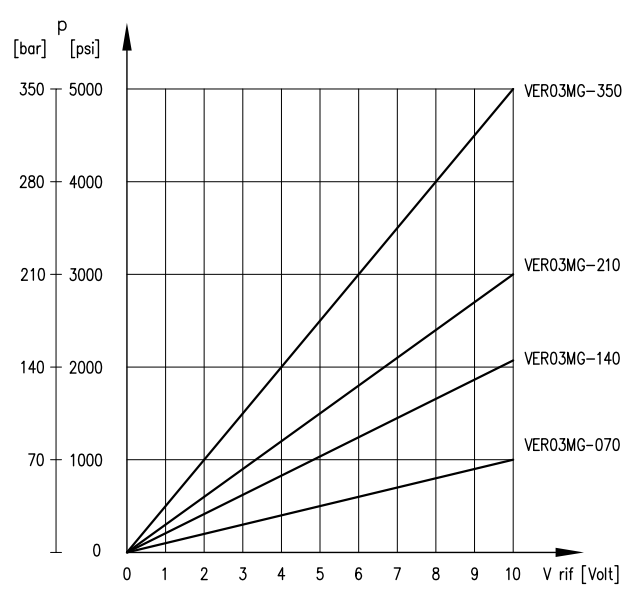
NOTES:

The full-scale pressure is set at factory with a flow rate of 0.26 gpm (1 l/min).

If the flow rate is higher the full-scale pressure will increase considerably as you can see in the pressure variations diagram.
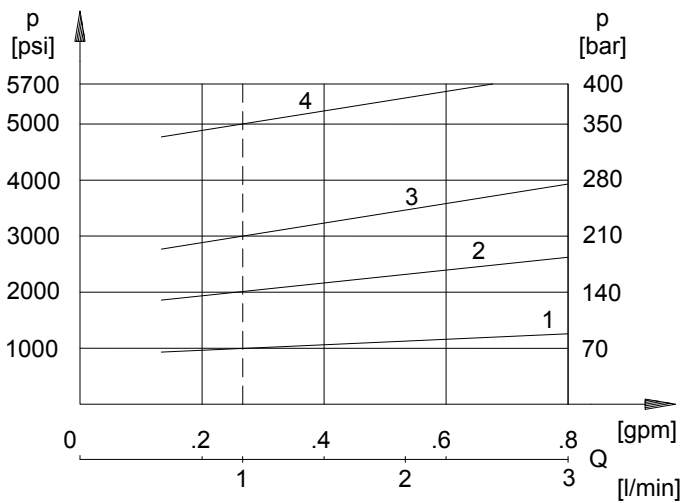
CHARACTERISTIC CURVES

MINIMUM ADJUSTMENT PRESSURE

NOTES:

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

PRESSURE VARIATIONS

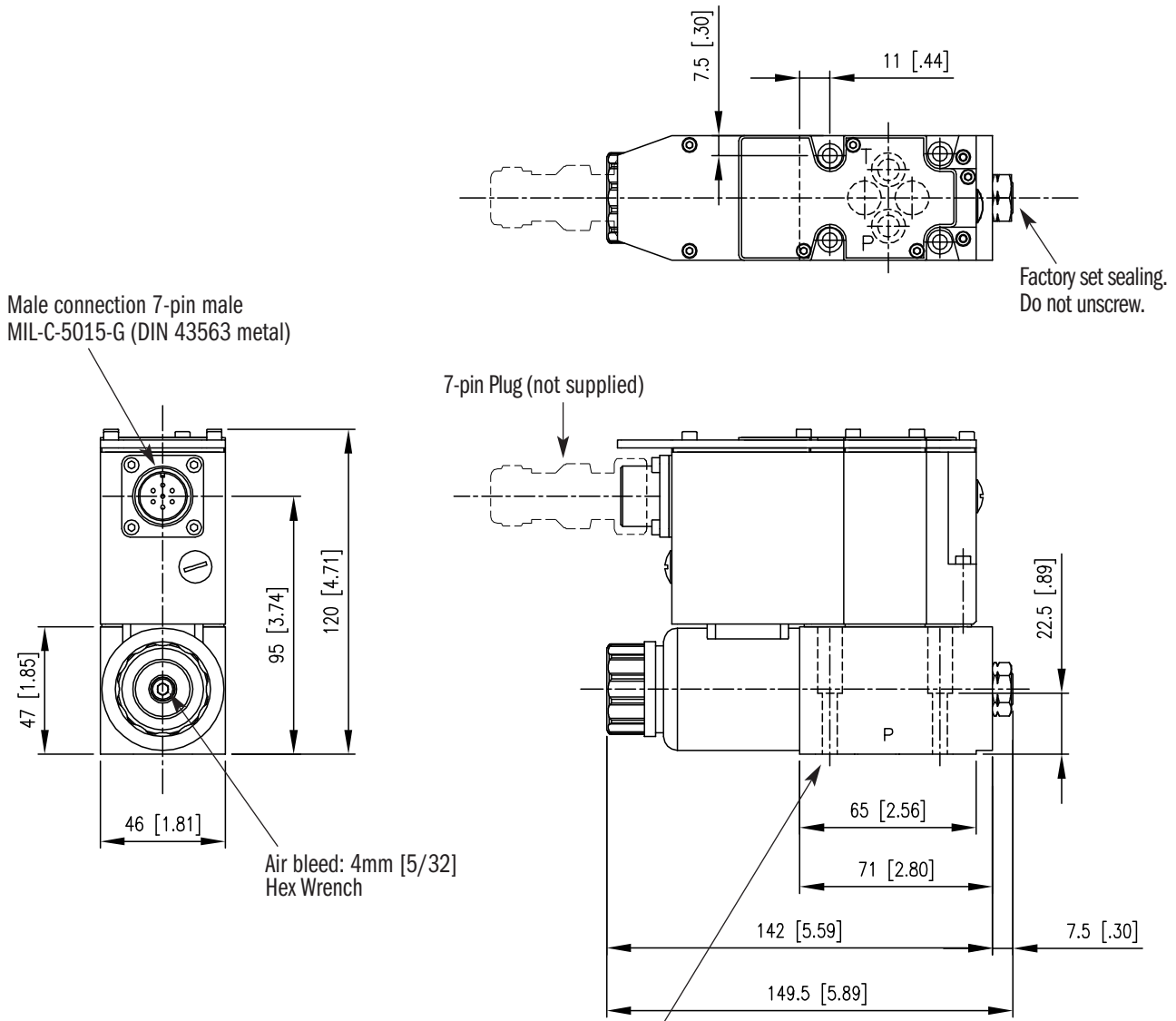| CURVE	VALVE
1	VER03MG-070
2	VER03MG-140
3	VER03MG-210
4	VER03MG-350

NOTE:

1. Full scale pressure is set at Q = 0.265 gpm (1 l/min).

OVERALL AND MOUNTING DIMENSIONS

Dimensions in mm [IN]

VER03MG

7.5 [.30]

11 [.44]

Factory set sealing.
Do not unscrew.

Male connection 7-pin male
MIL-C-5015-G (DIN 43563 metal)

7-pin Plug (not supplied)

95 [3.74]

120 [4.71]

47 [1.85]

22.5 [.89]

46 [1.81]

Air bleed: 4mm [5/32]
Hex Wrench

P

65 [2.56]

71 [2.80]

142 [5.59]

7.5 [.30]

149.5 [5.89]

Mounting surface with sealing rings: 4 pcs. AS568-012 90 Shore A

Ports A and B are blind holes with O-Ring seats.

⚠ In order to avoid electromagnetic noises and fulfill the EMC
regulations, a 7-pin metal plug according to MIL-C-2015 G
should be used instead of the standard plastic 6+PE
connector EN 175201-408 (formerly DIN 43563).

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 opening (100% of spool stroke)

It is possible to customize these and others parameters using the optional kit, 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/OBM) external enabling signal feature.

POWER SUPPLY		24V DC (19V to 35V, ripple max 3Vpp)
ABSORBED POWER		25 VA
MAX CURRENT		1.88 A
DUTY CYCLE		100%
MAIN CONNECTOR		7-pin MIL-C-5015 G (DIN 43563)
ELECTROMAGNETIC COMPATIBILITY (EMC)	Emissions	IEC EN 61000-6-4
	Immunity	IEC EN 61000-6-2
PROTECTION AGAINST ATMOSPHERIC AGENTS	IEC 60529	IP 67
ELECTRICAL PROTECTION		Overload electronics overheating, cable break, power failure or < 4 mA

E0 - VOLTAGE

COMMAND SIGNAL (DIFFERENTIAL)		0 - 10 V DC
MONITOR SIGNAL		0 - 10 V DC
IMPEDANCE	Command	> 11 kΩ
	Monitor	> 1 kΩ

E1 -CURRENT

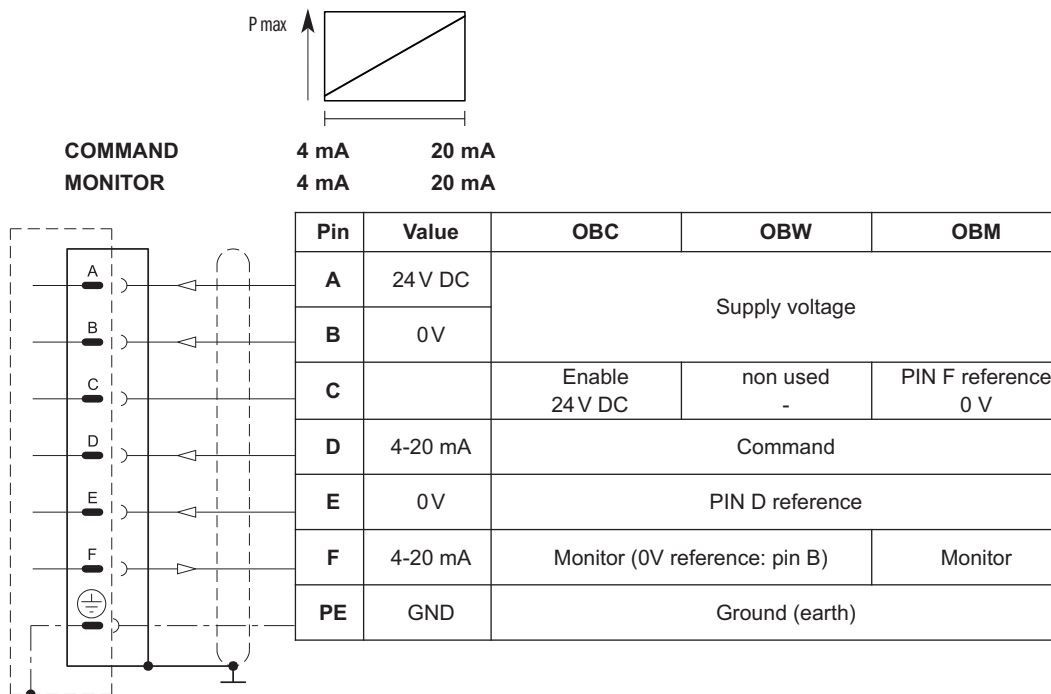| COMMAND SIGNAL (DIFFERENTIAL)		4 - 20 mA
MONITOR SIGNAL		4 - 20 mA
IMPEDANCE	Command	58 Ω
	Monitor	500 Ω

E0 VERSION - VOLTAGE REFERENCE SIGNAL

Reference signal required is 0-10 volt. The monitor signal is 0-10 volt. This signal is available 0.5 sec after card is powered on OBW / OBM.

P max

COMMAND	0V	+10V
MONITOR	0V	+10V

Pin	Value	OBC	OBW	OBM
A	24 V DC	Supply voltage		
B	0 V			
C		Enable 24 V DC	non used -	PIN F reference 0 V
D	0-10 V	Command (differential input)		
E	0 V	PIN D reference		
F	0-10 V	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (earth)		
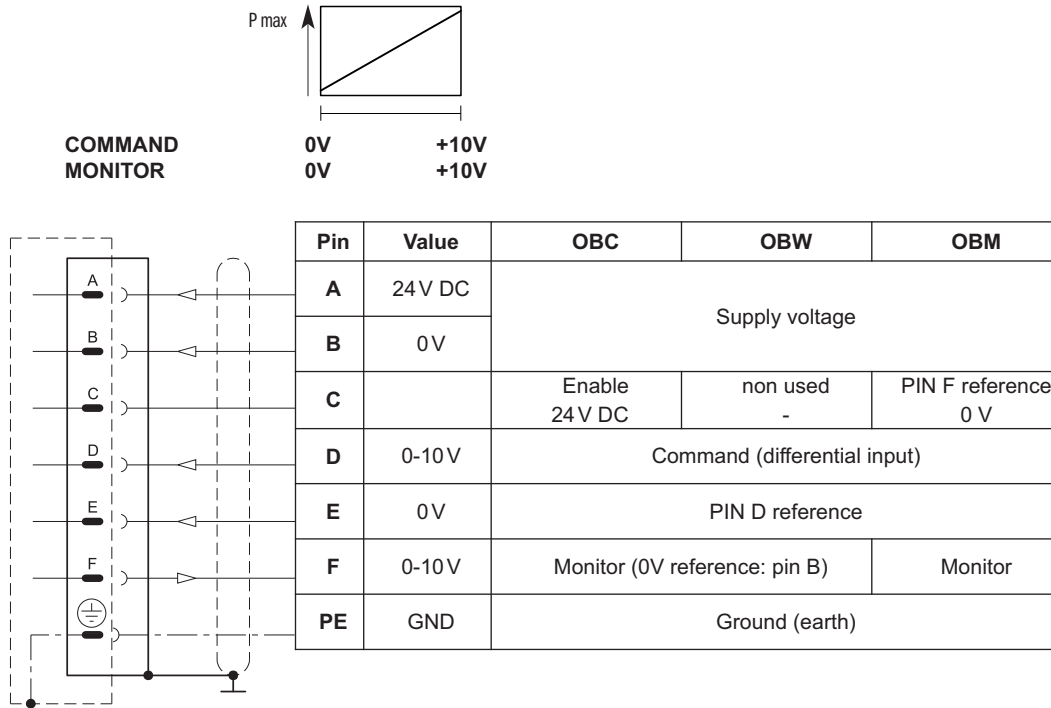
E1 VERSION - CURRENT REFERENCE SIGNAL

Reference signal required is 4-20 mA. If the current value drops below 4 mA the card shut down until the correct signal has been applied. The monitor signal is 4-20 mA. This signal is available 0.5 sec after card is powered on OBW / OBM.

P max

COMMAND	4 mA	20 mA
MONITOR	4 mA	20 mA

| Pin	Value	OBC	OBW	OBM
A	24 V DC	Supply voltage		
B	0 V			
C		Enable 24 V DC	non used -	PIN F reference 0 V
D	4-20 mA	Command		
E	0 V	PIN D reference		
F	4-20 mA	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (earth)		

OBC / OBW / OBM VERSIONS

OBC version is programmed for use of an external 24 volt Enable signal applied at Pin C to allow the valve to function. The Monitor signal output is referenced between Pin F and Pin B.

OBW version is programmed for Internal enable, power for enable is taken directly from the power supply. The power to the valve must be turned off to disable the valve. The Monitor signal output is referenced between Pin F and Pin B.

OBM version is programmed for Internal enable, power for enable is taken directly from the power supply. The power to the valve must be turned off to disable the valve. The Monitor signal output is reference between Pin F and Pin C for PIN to Pin interchangeability with other manufacturers.
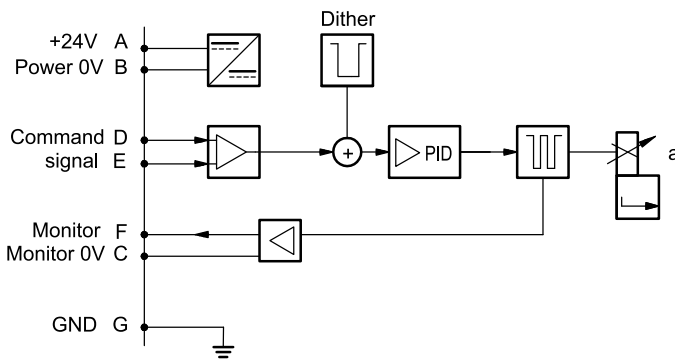
OBC ON-BOARD FUNCTION
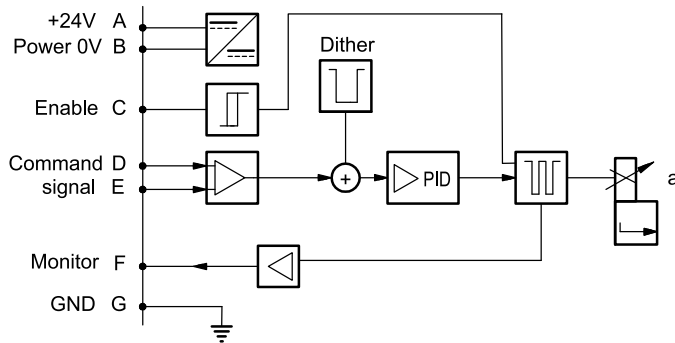
OBW ON-BOARD FUNCTION
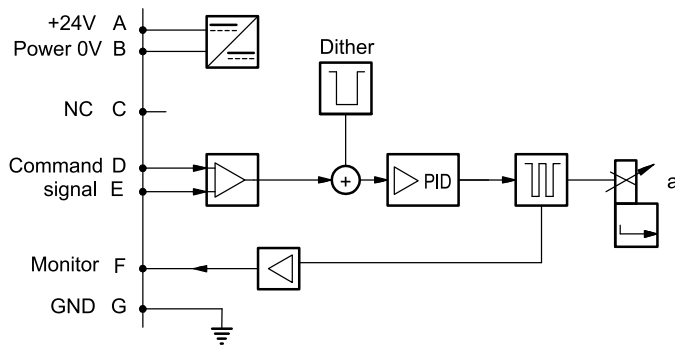
OBM ON-BOARD FUNCTION

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. ΔP1 = ΔP (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
MULTIPIER		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	- 40 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 VER03MG 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 entrapped 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.

Surface finishing

.0004/4.0

32
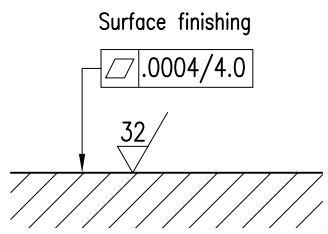
SEAL KIT

Buna Seal Kit	1013188
Viton Seal Kit	1013096

BOLT KIT

BD03-300	Valve only	1021512

NOTES:

1. Bolt Kit Consists Of: Qty. 4 10-24NC 3¼ screws

                          Qty. 4 #10 Lock washer

2. The recommended torque value for fasteners is: 4 lb.ft (5.4 Nm)

SUBPLATES

AD03SPS8S	Aluminium	SAE-08	265801AP
DD03SPS8S	Ductile		265801AI

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
CURATE
VATIVE
RECISE
URABLE
FICIENT
RSATILE

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4895 12th Avenue East, Shakopee, MN 55379 / continentalhydraulics.com / 952-895-6400

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