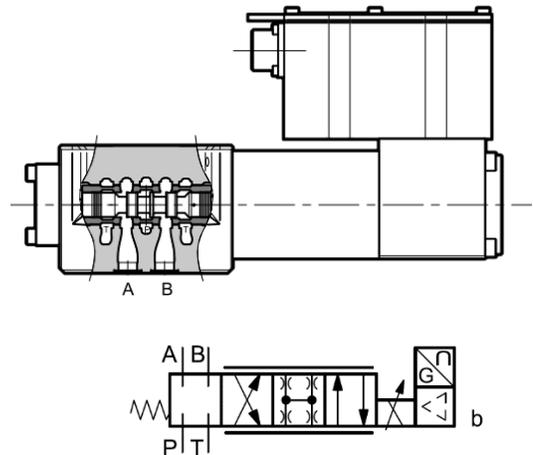
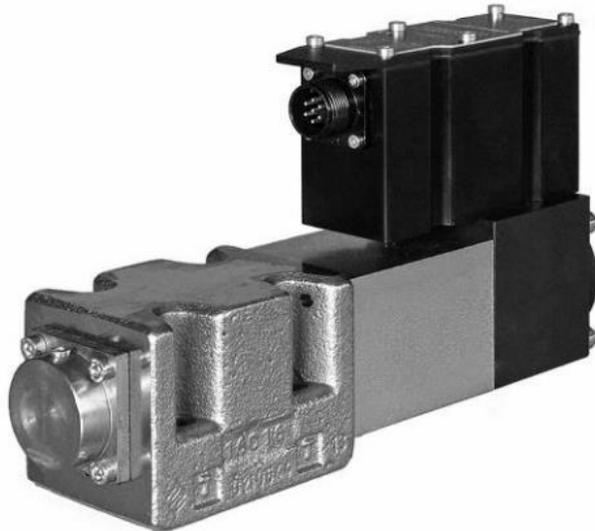


VED05MX

HIGH RESPONSE SERVO-PROPORTIONAL VALVE WITH FEEDBACK AND INTEGRATED ELECTRONICS



DESCRIPTION

Continental Hydraulics VED05MX, High Response 4-way servo-proportional valve with precision lapped Spool / Sleeve, spool position sensing LVDT and Enhanced On-Board Digital Amplifier.

FEATURES and OPERATION

The VED05MX valve is a 4-way (3 position + Fail-Safe Position) Servo-Proportional valve.

Spring offset and precision Line to Line Spool/Sleeve for no delay when crossing “null”, resulting in high dynamic performance and increased control when used in precision Positioning and Pressure control applications.

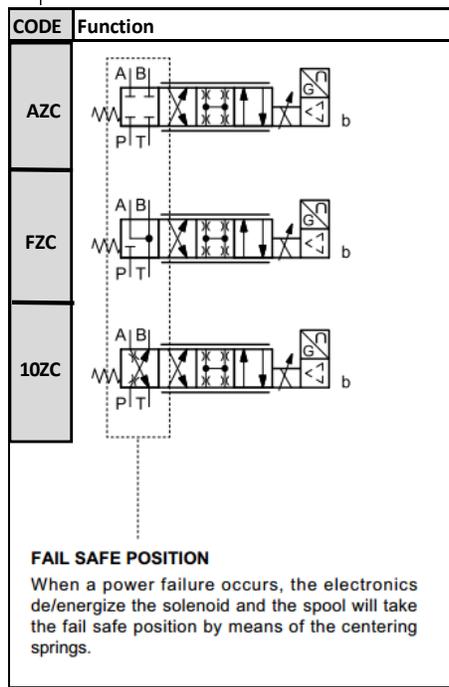
- High frequency response operation
- On-Board Digital Control resulting in extremely low Phase Lag and high frequency operation
- 3 position with Fail-Safe 4th Position
- Precision Lap Spool in Sleeve design provides zero crossing delay at Null
- Spool position feedback

TYPICAL PERFORMANCE SPECIFICATIONS

MAXIMUM OPERATING PRESSURE	P-A-B Ports	5000 PSI (350 Bar)
	T Port	3600 PSI (250 Bar)
Nominal Rated Flow		60 LPM - 100 LPM
1000 PSI (70 Bar) ΔP P-T		
Hysteresis	% of Q max	< 0.2 %
Threshold		< 0.1 %
Step Response		20 ms
Frequency Response (90° Phase Lag)		80 Hz at $\pm 10\%$ Signal
Mounting Surface		NFPA D05 ISO 4401-05-02-0-05
Contamination Level		(ISO 4406:1999 Class)
Preferred (Maximum)		16/14/11 (17/15/12)
Recommended viscosity		25 cSt
Temp Range	Ambient	-4 to +140° F -20 to +60° C
	Fluid	-4 to +180° F -20 to +80° C
Weight		13.2 lbs (6 kg)

VED05MX - [] - [] - [] - [] [] D - [] Design Letter

High Response Spool in Sleeve



Seal	
A	Buna (STD)
G	Viton

Connection Code	
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

Nominal Flow (LPM)	
(with ΔP 35 Bar / Land)	
60	60 l/min (15.8 gpm)
100	100 l/min (26.4 gpm)

Other Spool Options Available upon Request

Reference Signal	
E0	Voltage ± 10V (STD)
E1	Current 4-20 mA

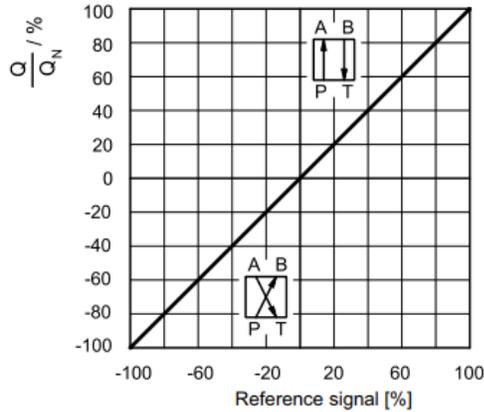
Electrical Characteristics

Duty Cycle		100% (Continuous Operation)	
Protection Class	EN 60529	IP65 / IP67	
Power Supply	Volts DC	24V DC (19 to 36 VDC, including ripple max 3 Vpp)	
Power Consumption	VA	60 VA	
Max Current	Amp	3.7 A	
Command Signal	voltage (E0)	V DC	±10 (Impedance Ri > 11 kOhm)
	current (E1)	mA	4 - 20 (Impedance Ri = 58 Ohm)
Monitor Signal	voltage (E0)	V DC	±10 (Impedance Ro > 1 kOhm)
	current (E1)	mA	4 - 20 (Impedance Ro = 500 Ohm)
Electrical Protection	Overload and electronic overheating, LVDT sensor error, cable break, supply voltage failure		
Communication	LIN-bus Interface (with Optional VEA-PB7 Programming Box)		
Main Connection		7-pin MIL-C-5015 G (DIN 43563)	
Electromagnetic Compatibility (EMC) According to 2014/30/EU standards	Emissions	IEC EN 61000-6-4	
	Immunity	IEC EN 61000-6-2	

CHARACTERISTIC CURVES

(measured with viscosity of 36 cSt at 50°C)

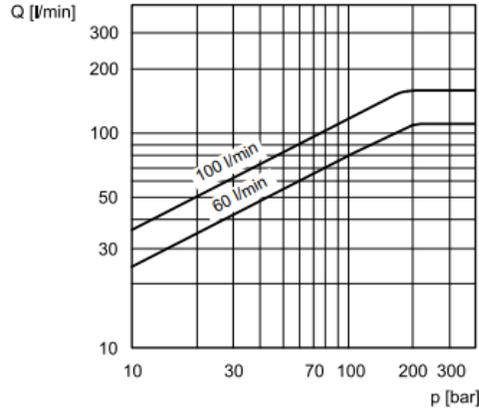
REFERENCE / FLOW RATE CURVE



Typical flow rate curves at constant $\Delta p = 70$ bar P-T according to the reference signal.

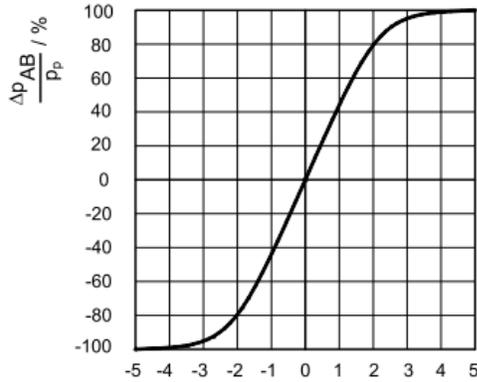
NOTE: with positive reference signal connected to pin D the valve regulates P - A / B - T.

FLOW RATE CURVE ACCORDING TO Δp



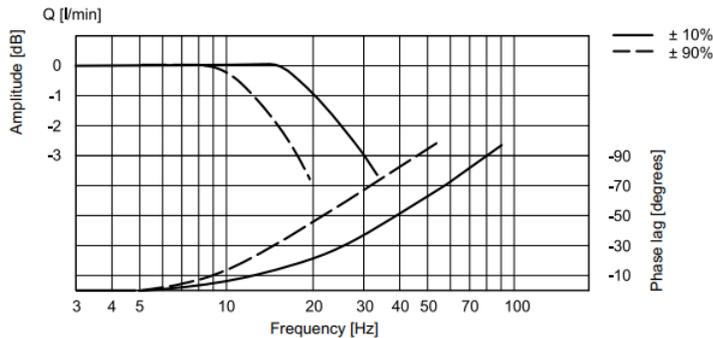
The diagram states the maximum valve controlled flow rate according to the pressure drop between the P and T ports.

PRESSURE GAIN

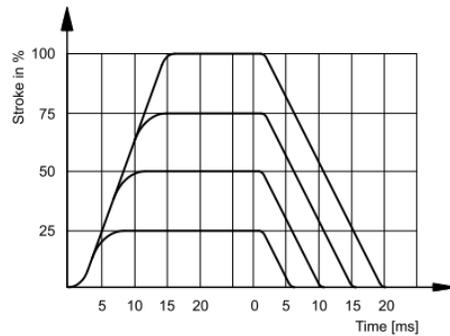


The diagram shows the valve pressure gain, expressed as % of the ratio between the port pressure variation in A or B (Δp_{AB}) and the P system pressure, according to the reference signal. In practice, the pressure gain states the valve reaction towards external disturbances aimed at changing the actuator position.

FREQUENCY RESPONSE

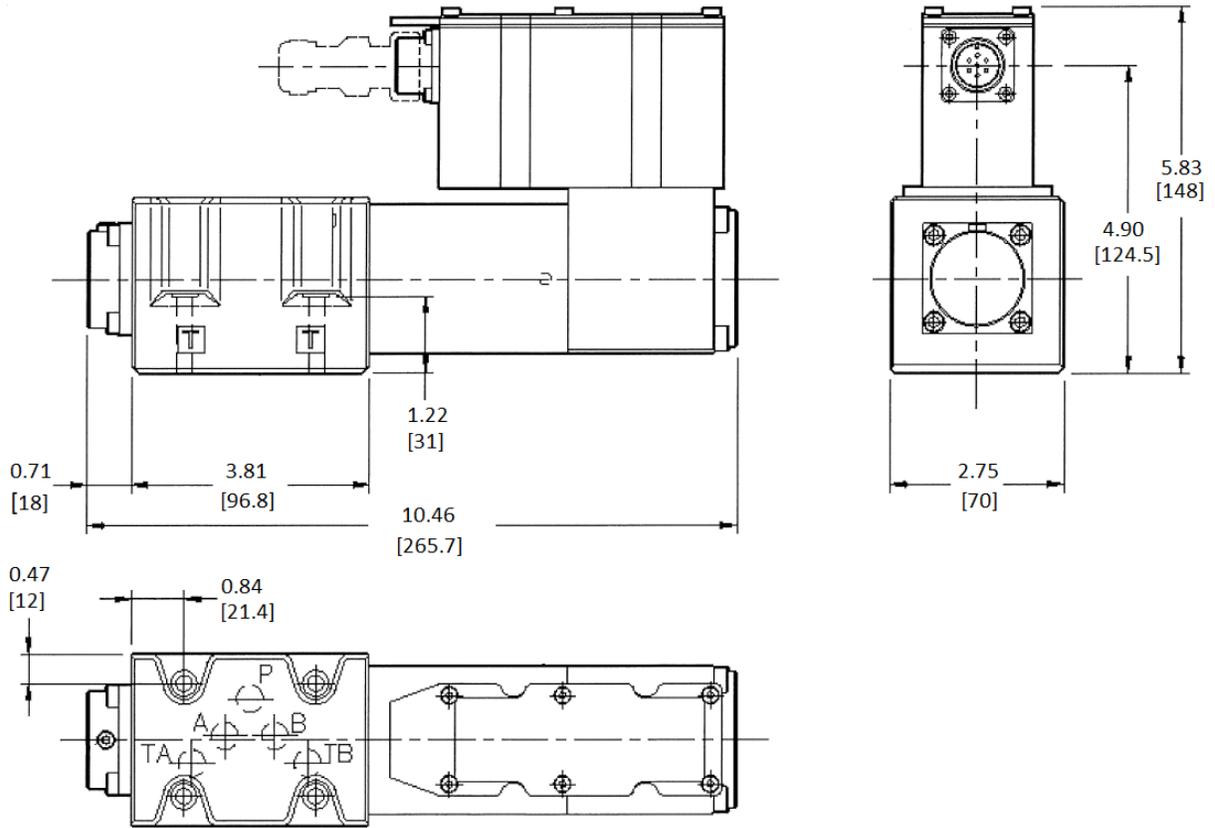


RESPONSE TIME



Due to inherent phase lag characteristics of the overall system and machine, common industrial control practices recommend, as rule of thumb, to utilize the 45°, or less phase lag frequency ratings, when applying Servo and Proportional valves to any position control loop for stable, repeatable and consistent control.

Dimensions: Inch [mm]



In order to avoid electromagnetic noises and fulfill the EMC regulations, a 7 pin metal plug according to MIL-C-5015 G should be used instead of the standard plastic 6+PE plug.

The plug is not supplied, but can be ordered separately.

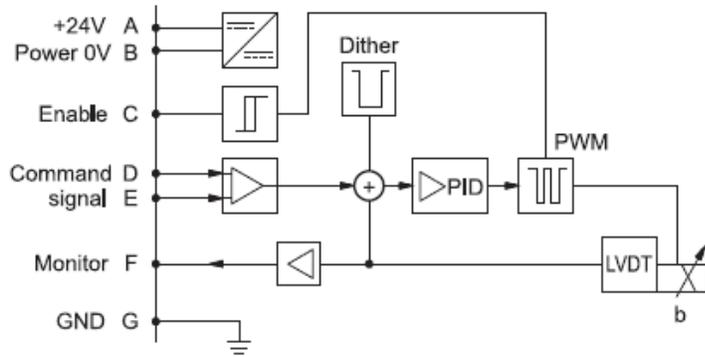
OBC / OBW / OBM Versions

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.

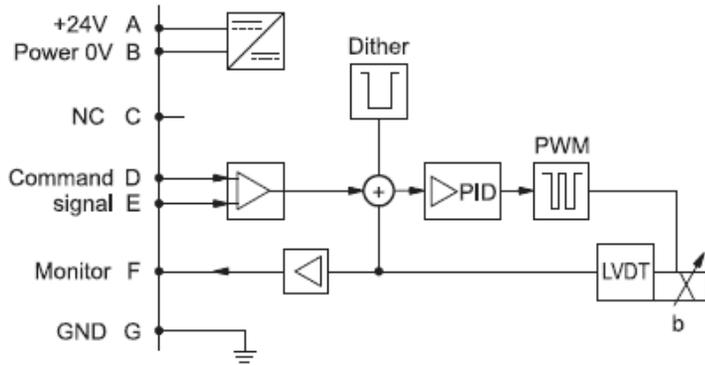
OBW version is programmed for Internal enable, power for enable is taken directly from the power supply. The power to the valve must be turned off to disable the valve. The Monitor signal output is referenced between Pin F and Pin B.

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 referenced between Pin F and Pin C for Pinout interchangeability with other manufacturers.

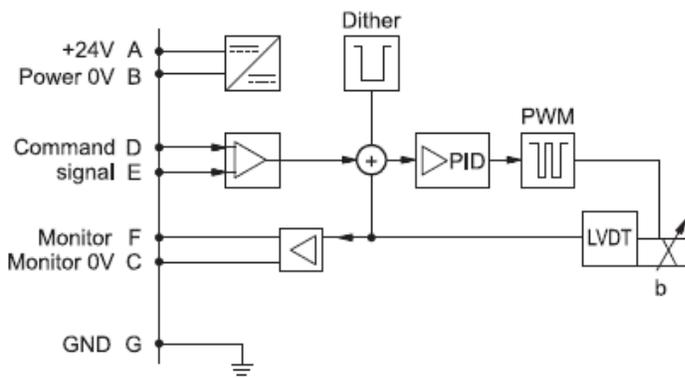
OBC On-board Function



OBW On-board Function



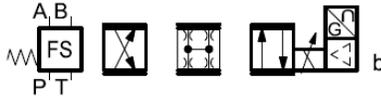
OBM On-board Function



E0 VERSION - VOLTAGE REFERENCE SIGNAL

Reference signal required is ± 10 volt.

The monitor signal is ± 10 volt. This signal is available 0.5 sec after card is powered on OBW / OBM.

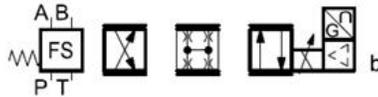


COMMAND -10V 0V +10V
 MONITOR -10V 0V +10V

Pin	Value	OBC	OBW	OBM
A	24V DC	Supply voltage		
B	0V			
C		Enable 24V DC	non used -	PIN F reference 0V
D	± 10 V	Command (differential input)		
E	0V	PIN D reference		
F	± 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 will 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.



COMMAND 4 mA 12 mA 20 mA
 MONITOR 4 mA 12 mA 20 mA

Pin	Values	OBC	OBW	OBM
A	24V DC	Supply Voltage		
B	0V			
C		Enable 24V DC	not used -	PIN F reference 0V
D	4 + 20 mA	Command		
E	0V	PIN D reference		
F	4 + 20 mA	Monitor (0V reference: pin B)		Monitor
PE	GND	Ground (Earth)		

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.

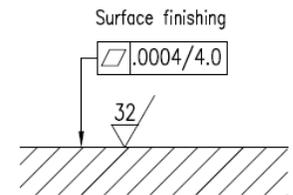
From a safety standpoint, temperatures above 130 degrees F are not recommended.

INSTALLATION

VED05MX valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.

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.



7 PIN PLUG

VEA-3P7P-A	Straight plug 7-pin plastic housing	264893
VEA-3P7M-A	Straight plug 7-pin metal housing	265947

BOLT KIT

BD05-163-B	Valve only	1013160
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NOTES:

1. Bolt kit consists of: qty. 4 screws 1/4-20 UNC x 1-3/4 and lock washer
2. The recommended torque value for fasteners is: 6 lb.ft (8.13 Nm)