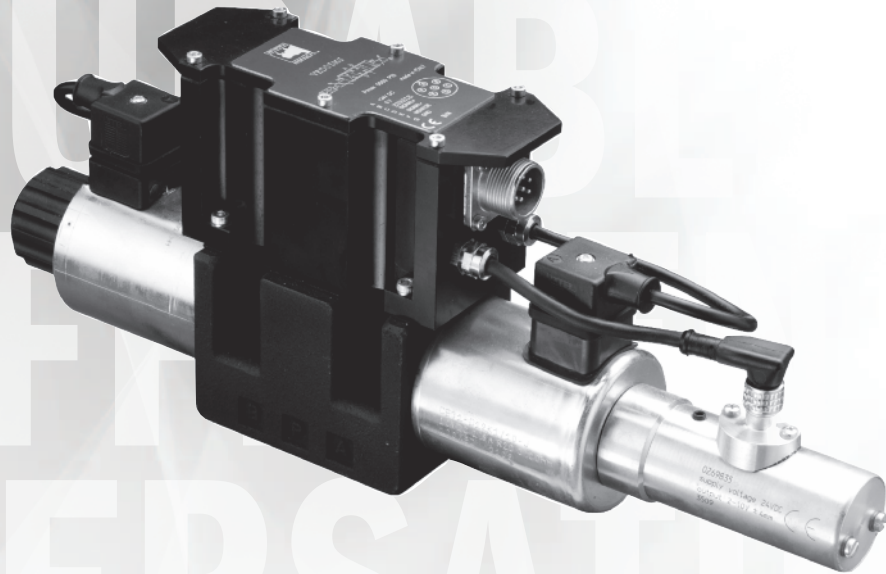




CONTINENTAL HYDRAULICS

VED05MJ

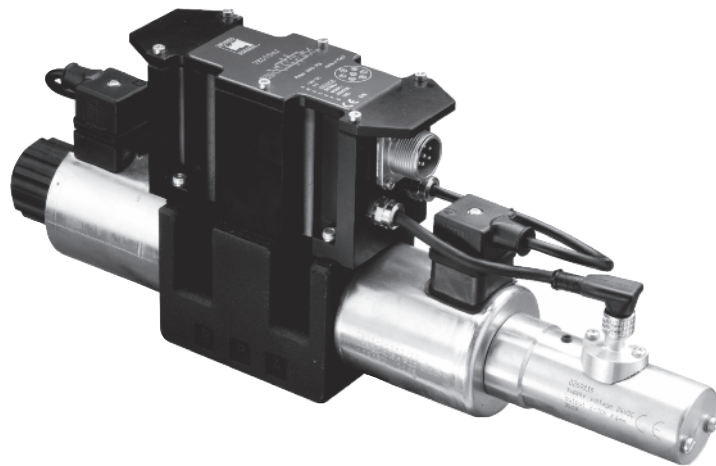
PROPORTIONAL DIRECTIONAL CONTROL VALVES WITH OBE & POSITION FEEDBACK



VED05MJ - PROPORTIONAL DIRECTIONAL CONTROL VALVES WITH OBE & POSITION FEEDBACK

VED05MJ

PROPORTIONAL DIRECTIONAL CONTROL VALVES WITH OBE & POSITION FEEDBACK



DESCRIPTION

Continental Hydraulics VED05MJ direct operated 4-way proportional valves with On-Board Digital Amplifier conform to NFPA D05/ISO 4401-05 mounting standards.

OPERATION

These valves are designed to control the direction and oil flow rate based on the degree of command signal supplied to the On-Board Amplifier. In event of a loss in electrical power, the centering springs will return the valve spool to the center position.

This valves series is also available with a Fail Safe option.

The Spool Position Sensor circuit improves the overall valve performance by reducing hysteresis and improving response times.

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

TYPICAL PERFORMANCE SPECIFICATIONS

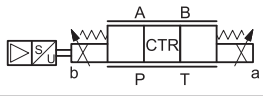
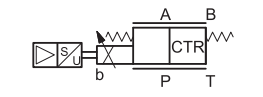
MAXIMUM OPERATING PRESSURE	P - A - B Ports	4600 psi	320 bar
	T Port	3000 psi	210 bar
FLOW CAPACITY WITH Δp 143 PSI (10 BAR)	AC/FC/ZC-50	13 gpm	50 l/min
	AC/FC/ZC-75	20 gpm	75 l/min
MOUNTING SURFACE		NFPA D05 ISO 4401-05-04-0-05	
HYSTERESIS	% of Q max	< 0.2%	
REPEATABILITY	% of Q max	< \pm 0.1%	
THRESHOLD		< 0.1%	
POWER SUPPLY		24V DC (19V to 35V, ripple max 3 Vpp)	
	Max Current	3A	
CONNECTION		7 pin DIN 43563 metal	
PROTECTION	IEC 60529	IP 65 / 67	
WEIGHT	Single Solenoid	12.3 lbs	5.6 kg
	Dual Solenoid	15.7 lbs	7.1 kg

RANGE TEMPERATURES	Ambient	- 4 to +140 °F	-20 to +60 °C
	Fluid	- 4 to +176 °F	-20 to +80 °C
FLUID VISCOSITY	Range	60 -1900 SUS	10 - 400 cSt
	Recommended	120 SUS	25 cSt
FLUID CONTAMINATION		ISO 4406:1999 Class 18/16/13	

IDENTIFICATION CODE

VED05MJ - [] - [] - [] - [] - [] **D** - [] _____ DESIGN LETTER

POSITION FEEDBACK

FUNCTION	
3	 <p>Dual Solenoid 3 Position Spring Centered</p>
5	 <p>Single Solenoid 2 Position Spring Centered</p>

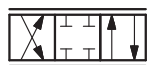


SEAL	
A	Buna (STD)
G	Viton

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

NOMINAL FLOW (with Δp P-T 143 psi)	
50	50 l/min (13 gpm)
75	75 l/min (20 gpm)
70/35	Asymmetrical spool: 70 l/min (18 gpm) on P-A 35 l/min (9 gpm) on P-B

TYPICAL ORDERING CODE:
VED05MJ-3AC-50-A-OBWE0D-D

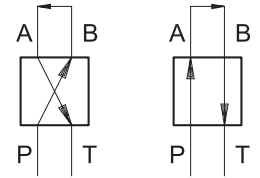
SPOOLS				
NAME	SYMBOL	DESCRIPTION	APPLICATION	FUNCTION MATCHING
AC		METER IN / METER OUT	MOTION CONTROL	3, 5
FC				
ZC				3



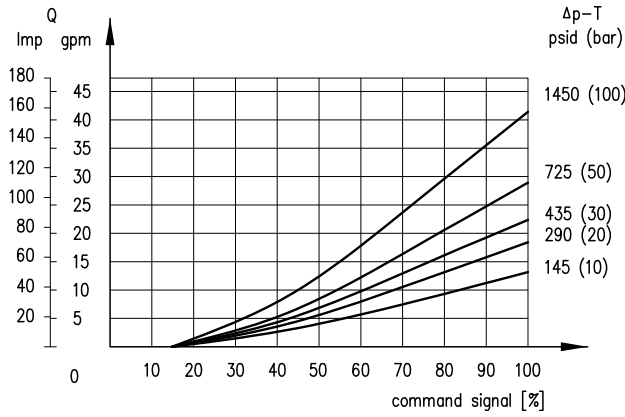
PERFORMANCE CURVES - FLOW GAIN

Typical flow rate curves at constant Δp related to the reference signal and measured for the available spools and obtained after linearization in factory of the characteristics curve through the digital amplifier.

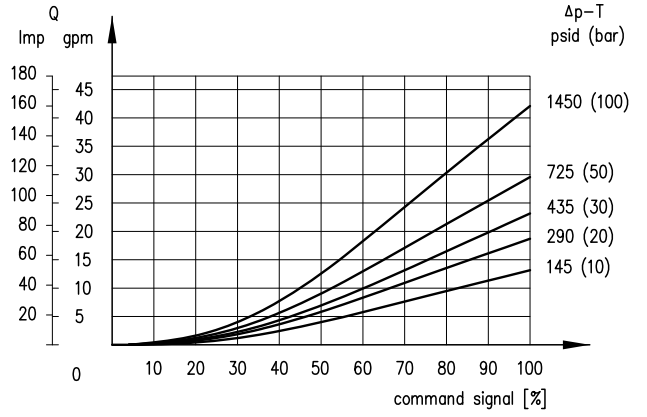
The Δp values are measured between P and T (full loop) valve ports.



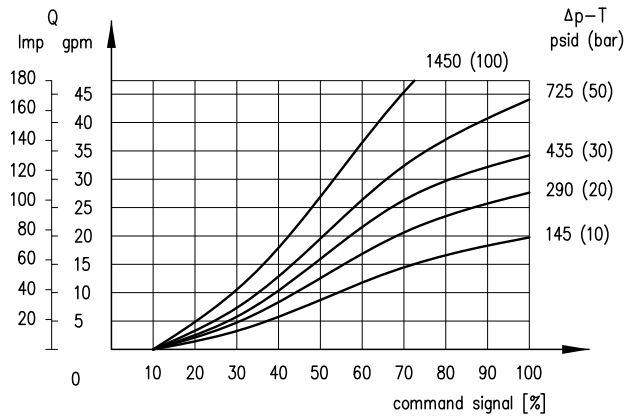
AC-50, FC-50



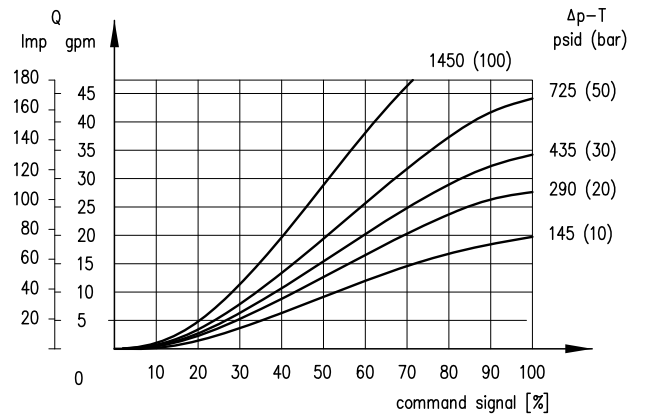
ZC-50



AC-75, FC-75



ZC-75

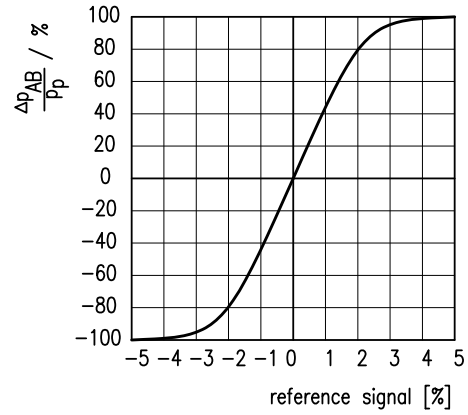


NOTES:

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

PRESSURE GAIN FOR SPOOLS "ZC"

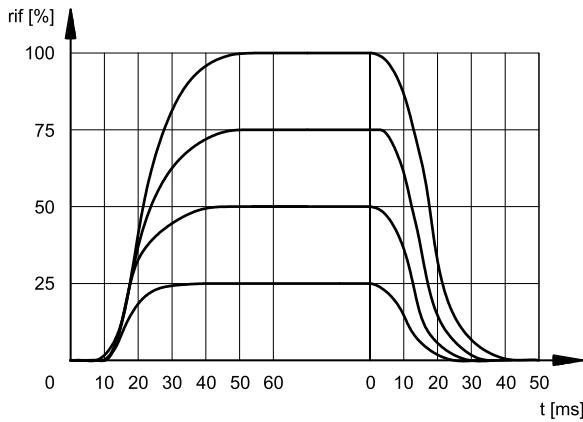
The diagram shows the valve pressure gain, expressed as % of the ratio between the port pressure variation in A or B (Δp_{AB}) and the P system pressure, according to the reference signal. In practice, the pressure gain states the valve reaction towards external disturbances aimed at changing the actuator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



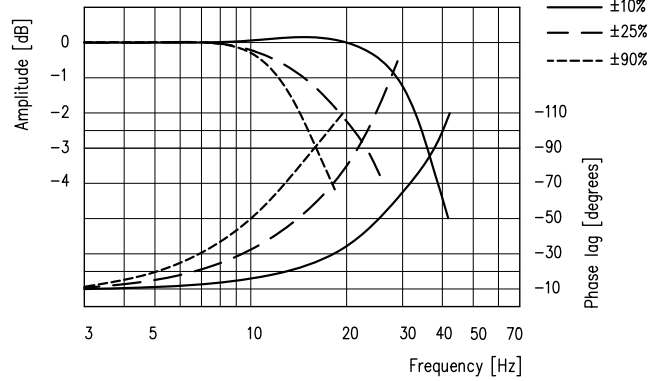
FREQUENCY RESPONSE (TYPICAL)

Frequency response and response time obtained with mineral oil viscosity of 170 sus (36 cSt) at 122°F (50°C) and with on-board electronics and Δp (P-T) 143 psi.

RESPONSE TIME



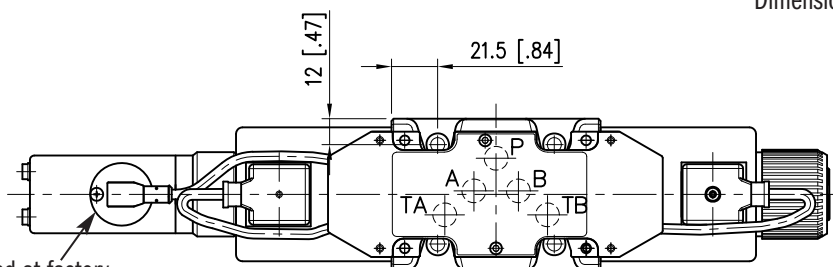
SIGNAL



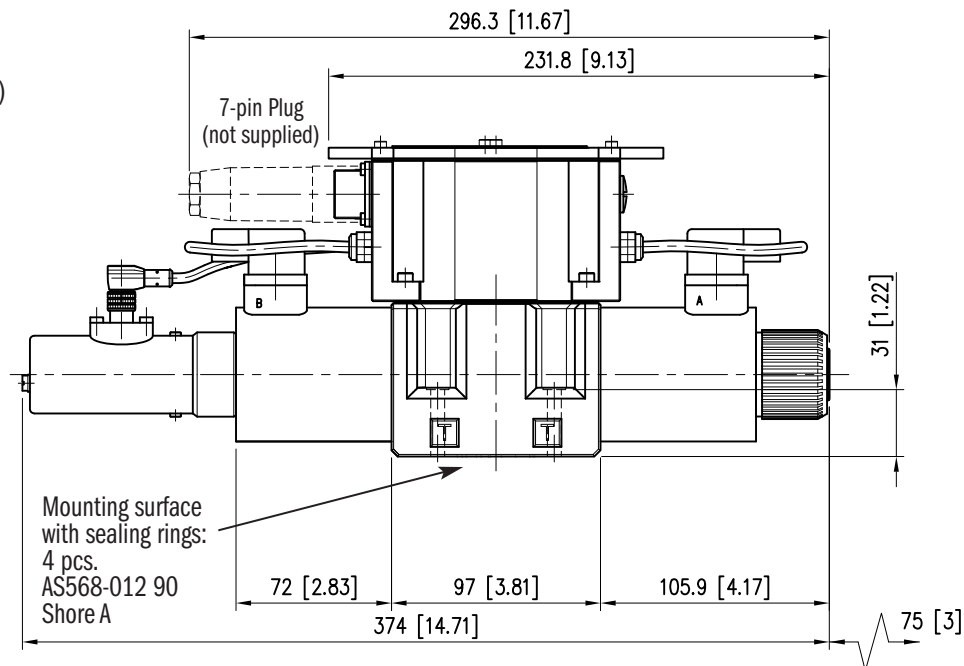
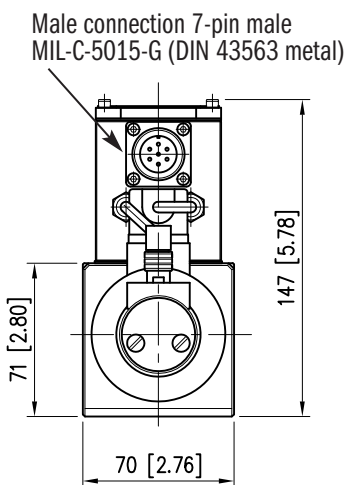
OVERALL AND MOUNTING DIMENSIONS

Dimensions in mm [IN]

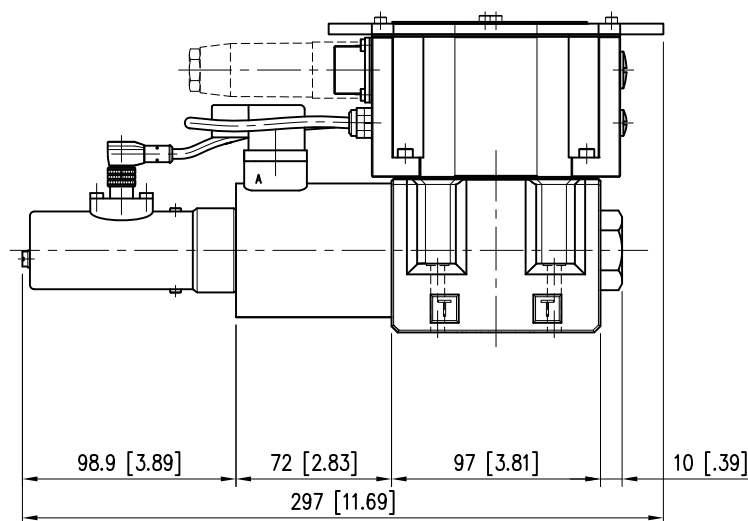
VED05MJ-3



Adjustment sealing performed at factory.
Do not disassemble the transducer.



VED05MJ-5



Coil Removal Space
(Solenoid A only)



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).

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

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
- Deadband compensation preset at factory
- 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

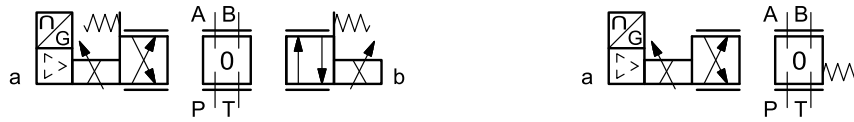
The electronic card is available with (OBC) or without (OBW/OBM) external enabling signal feature.

POWER SUPPLY	24V DC (19V to 35V, ripple max 3Vpp)	
ABSORBED POWER	40 VA	
MAX CURRENT	2.8 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 65 / 67
ELECTRICAL PROTECTION	Overload electronics overheating, LVDT sensor error, cable break power failure or < 4 mA	

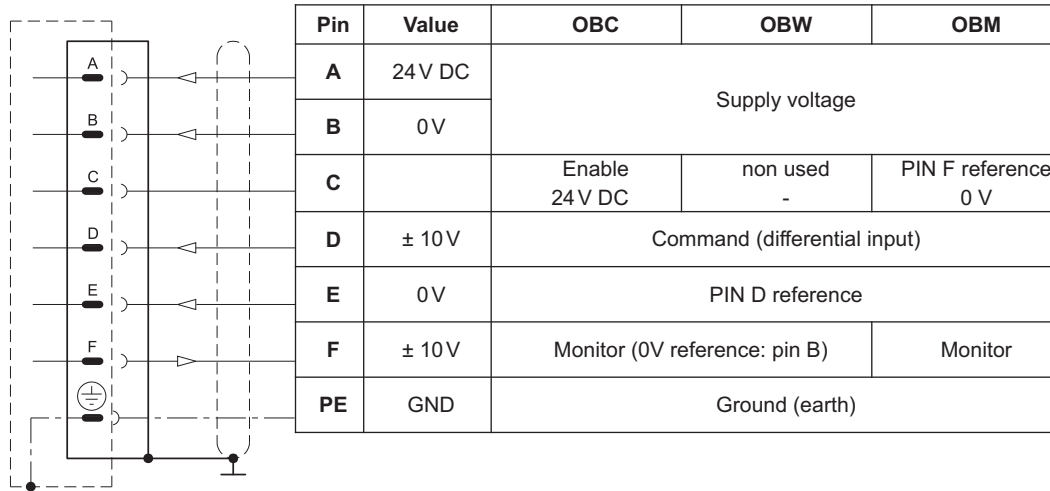
COMMAND SIGNAL	voltage (E0)	V DC	±10 (Impedance Ri > 11 kΩ)
	current (E1)	mA	4-20 (Impedance Ri = 58 Ω)
MONITOR SIGNAL	voltage (E0)	V DC	±10 (Impedance Ro > 1 kΩ)
	current (E1)	mA	4-20 (Impedance Ro = 500 Ω)

E0 VERSION - VOLTAGE REFERENCE SIGNAL

Reference signal required is ± 10 volt on dual solenoid valves, and 1-10 volt for single solenoid valves.
The monitor signal is ± 10 volt. This signal is available 0.5 sec after card is powered on OBW / OBM.

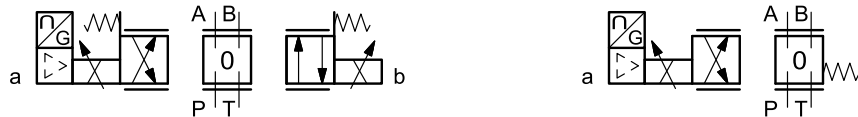


COMMAND	-10V	0V	+10V	COMMAND	+10V	0V
MONITOR	-10V	0V	+10V	MONITOR	+10V	0V

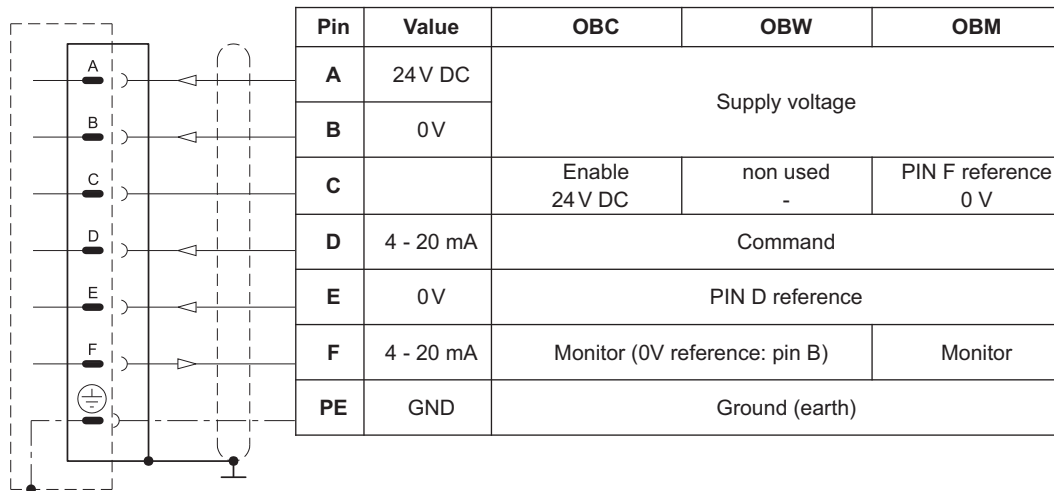


E1 VERSION - CURRENT REFERENCE SIGNAL

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.



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



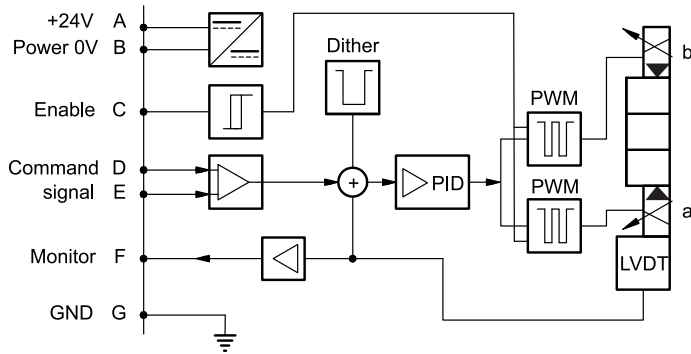
OBC / OBW / OBM VERSIONS

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.

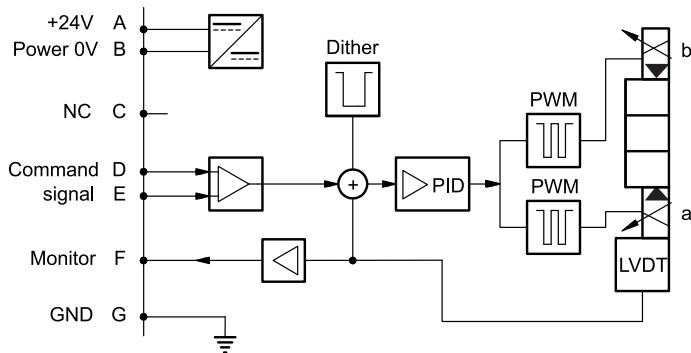
OBW version is programmed for Internal enable, power for enable is taken directly from the power supply. The power to the valve must be turned off to disable the valve. The Monitor signal output is referenced between Pin F and Pin B.

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.

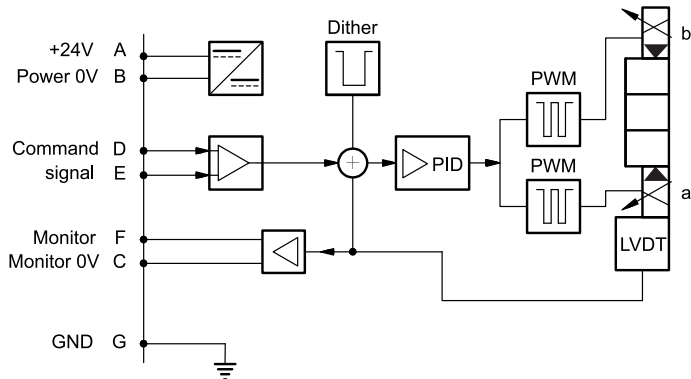
OBC ON-BOARD FUNCTION



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. $\Delta P1 = \Delta P (G1/G)$. 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.

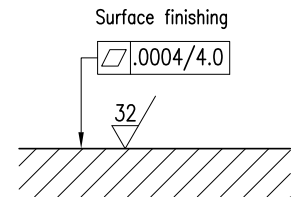
From a safety standpoint, temperatures above 130 degrees F are not recommended.

INSTALLATION

VED05MJ 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)

SEAL KIT

Buna Seal Kit V*D05M DES B	1013142
Viton Seal Kit V*D05M DES B	1013146

SUBPLATES

AD05JESPS16S	Aluminium	SAE-16	1013140
DD05JESPS16S	Ductile	SAE-16	1013041

NOTES:

1. Max pressure aluminium subplate: 3000 psi max pressure ductile subplate: 5000 psi
2. Always verify that subplate port size is proper for the application
3. Kit consists of 1 subplate and 2 SAE-04 plugs for pilot and drain ports as they are unused



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