

Engineered Reliability And Precise Control

Hydraulic/Pneumatic R-DDV[®] Servovalves



WOODWARD

Superior Performance

R-DDV[®] Servovalve Principles of Operation

The Woodward Airframe Systems R-DDV[®] (Rotary-Direct Drive Valve) Servovalve is a proven, unique and rugged servovalve design. The limited angle, rotary torque motor drives a valve spool directly through an “eccentric” which is built into the motor shaft. Rotary operation of the motor results in a linear spool motion which modulates fluid flow through the control ports of the valve.

The R-DDV[®] Servovalve utilizes an integrated electronic controller which is packaged into the motor enclosure. The controller compares spool position, which is monitored by an electronic device within the motor, with the input command signal. The resulting difference generates a current signal which drives the motor to the commanded position. This signal is electronically enhanced to provide optimum valve performance and linearity.

Performance

- Fast valve response independent of pressure (electric drive)
- Low internal leakage
- Operating pressures from vacuum to 5000 psi

Reliability

- Exceptional reliability (no nozzles, jets or filters to plug)
- Stainless steel body
- Vibration rated 40 g's
- Shock rated 60 g's
- Low parts count

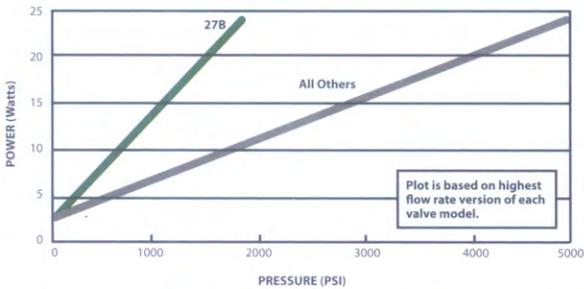
Flexibility

- Compact size
- Hydraulic or pneumatic operation
 - 0.18 – 60 gpm hydraulic flow
 - 0.45 – 136 scfm pneumatic flow
- Easily interchangeable
- Variety of input commands (mA and Volts)
- ATEX certified for hazardous environments for model 27G

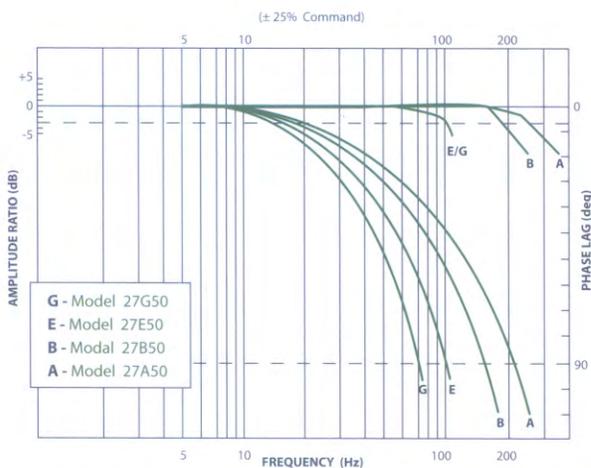
Ease of Use

- Four pin electrical connector or pigtailed
- Electronic control cards available
- Wide variety of manifolds and adapters available

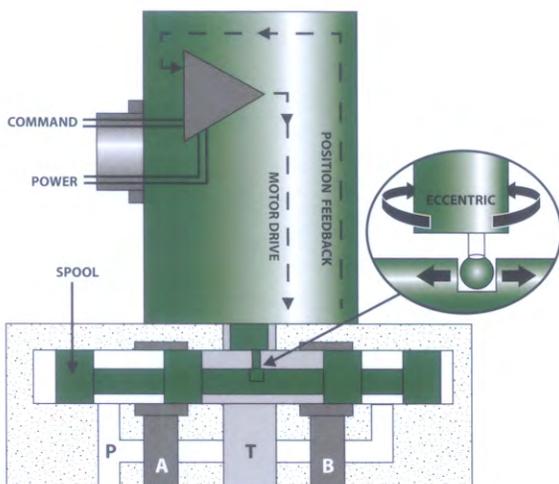
Input Power Versus Pressure



Frequency Response



SCHEMATIC DIAGRAM



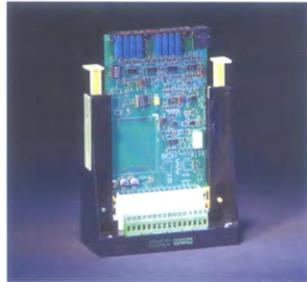
And Exceptional Reliability

MODEL EC250GP

General Purpose PID Control Card



(EC250GP control card)



(Shown with Card Holder CH250 enabling convenient mounting of the EC250GP control card. Electrical connections are made via screw terminals)

This cost-effective PID card for closed loop servo systems provides great adjustability and a wide array of options to easily adapt to your application.

- Provides all position control loop functions for one servovalve with electronic feedback device.
- Designed for use with all Woodward Airframe Systems R-DDV[®] Servovalves or other compatible servovalves.
- Second feedback loop for pressure control or special applications. Allows Acceleration, Force, Velocity, or Pressure feed back, as primary loop or summed with position.

Front Panel Controls

- Proportional, Integral, and Derivative (PID) gains on position loop
- Actuator Position – Min. Command (zero)
- Actuator Position – Max. Command (span)
- Actuator Velocity Limit (maximum servovalve command)
- Proportional and Derivative gains on second loop
- “Wire Break” Indicator lamp
- Manual Input Jack for user-supplied 1K pot or Woodward Airframe Systems Manual Control Potentiometer Assembly

Analog (0 – 10 Volt or 4 – 20 mA) input

Analog (± 5 Volt) valve drive output

Card size: 6.3” x 4.0” (3U form factor)

Connector: DIN 41612 F48

On-board 10 Volt reference supply

Analog (0 – 10 Volt or 4 – 20 mA) position feedback

On-board LVDT signal conditioning

Strain Gage signal conditioning on second loop for force or pressure transducer

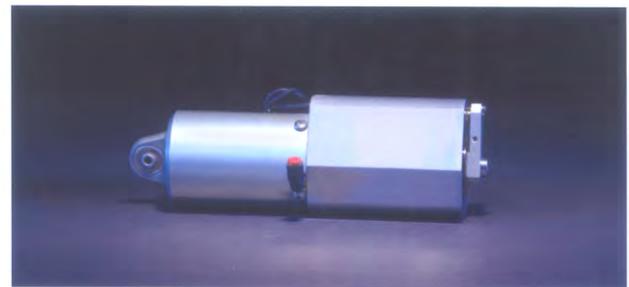
Options

Manual Control Potentiometer Assembly (TT200PT)

CH250 single card holder with screw terminals

MODEL EFB

Integrated Pneumatic Servoactuators



This complete, high performance, pneumatic actuator is for applications requiring superior analog operation.

- Model 27A50 R-DDV[®] Servovalve
- Feedback Potentiometer or LVDT
- Low-Breakaway Friction
- Built-in Anti-rotation
- Low Installed Cost
- Easy Field Adjustment
- Flexible Command Input
- Simple Interface Requirements
- Unsurpassed Low Pressure Operation
- Standard Sizes Available:
 - Bore - 1, 2 and 2-1/2 Inch Diameter
 - Stroke to 2 Inches

Options

EC250GP Loop Closure Card



Model (5)	Mounting O-ring (5) (Port Size) [Bolt Size]	Rated Flow (±10%)		Internal Leakage (Max)		Max Continuous Steady State Operation		Chip Shear (lbs)(1)	Electrical Interface (2)
		Oil (gpm) @ 1000 psid	Air (scfm) @ 100 psi	Oil (gpm) @ 1000 psid	Air (scfm) @ 100 psi	Supply Pressure (psi)	Power Supply Current (amps) (1)		
27A50 (0.480 port circle) 2.03 x 1.30 x 3.4 high 0.8 lbs	.237 ID x .040 w (0.15 diameter) [0.138-32 x 1.0]	0.18	0.45	0.02	0.06	5000	0.1	19	4 wires: 2 power & 2 command
		0.4	1	0.02	0.06		0.15		
		0.9	2	0.02	0.06		0.25		
		1.8	4	0.02	0.08		0.45		
		3.5	8	0.03	0.16		1		
27B50 (D03) 3.75 x 1.72 x 3.82 high 1.9 lbs	AS568 - 012 (0.31 diameter) [0.190-24 x 0.875]	0.2	0.5	0.03	0.08	5000	0.1	50	(In-line Connectors Available)
		0.6	1.5	0.03	0.08	5000	0.2		
		1.2	3	0.03	0.08	5000	0.4		
		2.5	6	0.05	0.12	5000	0.9		
		5	11.5	0.06	0.23	3000 (3)	1		
		8	18	0.07	0.36	2000 (3)	1		
27E50 (0.875 port circle) 4.05 x 3.15 x 5.3 high 5.1 lbs	AS568 - 013 (0.365 diameter) [0.312-18 x 1.5]	10	23	0.15	0.46	5000	0.6	83	Connector: CF3102E-14S-2P
		15	34	0.20	0.68		0.2		
		20	46	0.25	0.92		0.2		
27G50 (1.75 port circle) 6.2 x 3.0 x 7.0 high 10.7 lbs	AS568 - 018 (0.565 diameter) [0.312-18 x 1.5]	20	46	0.3	0.92	5000	0.5	83	Mates with: MS3106F-14S-2S
		30	68	0.4	1.4	5000	0.7		
		40	92	0.5	1.8	5000	0.9		
		60	136	0.6	2.7	3000 (3)	0.9		
All Models	Rated Pressure		Static: 5000 psi all ports / Impluse: 5000 psi P A B ports, 1000 psi T port						
	Null Bias		< ± 1.0% of Rated Command						
	Threshold (Max)		< 0.5% of Rated Command						
	Hysteresis (Max)		< 1.0% of Rated Command						
	Operating Temperature Range		-40° to 160° F (4)						
	Recommended Fluid Cleanliness		ISO 4406 code 16/13						
	Power Supply Required		24 VDC, 2.0 amps						
	Command Input Signal		±VDC or ±mA, a variety of options available - see www.r-ddv.com						

(1) Power supply current for high frequency operation and chip shear: up to 2 amps maximum

(2) See www.r-ddv.com for wiring polarity

(3) Listed supply pressure is for continuous steady state operation at 100% command. Operation up to 5000 psi is possible for less than 100% command and/or less than continuous operation. Consult Woodward Airframe Systems

(4) Higher temperature operation available. Consult Woodward Airframe Systems

(5) Dimensions in inches



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