



High Country Tek, Inc.

epc-2 & Sauer Series 90 Pumps

Electronic Controller Solutions for the Mobile, Industrial &



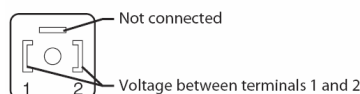
- Made in USA for quality and reliability
- Compatible with ALL major OEM hydraulics
- CE compliance, use on export applications
- SAE J1939 communication compatibility
- +10 to +32VDC input supply range
- - 40C to + 85C to operating temperature range
- Fully 'Potted' for vibration & shock protection
- Hermetically sealed from external environment
- Single, industry standard input/output connector
- Diagnostic LED's for accurate operational status



Series 90 Axial Piston Pumps
Technical Information

3 - Position (FNR) Electric Control:

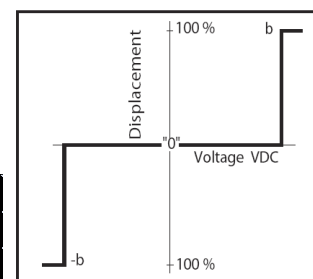
The 3-position (F-N-R) control uses an electric input signal to switch the pump to either full stroke position as fast as possible.



Shaft Rotation	CW		CCW	
	A	B	A	B
Port A flow	Out	In	In	Out
Port B flow	In	Out	Out	In
Servo Cylinder	M5	M4	M5	M4

Voltage	Power	Connector
12VDC	33W	DIN 43650
24VDC	33W	DIN 43650

Pump displacement vs. electrical signal



Electric Displacement Control (EDC):

This option allows the pump to be accurately controlled to give any displacement required for forward or reverse flow needs.

Shaft Rotation	CW		CCW	
	A or C	B or D	A or C	B or D
Port A flow	Out	In	In	Out
Port B flow	In	Out	Out	In
Servo Cylinder	M5	M4	M5	M4

Pump output flow direction V's control current:
EDC using single or dual coils in parallel.

Shaft Rotation	CW		CCW	
	A	D	A	D
Port A flow	Out	In	In	Out
Port B flow	In	Out	Out	In
Servo Cylinder	M5	M4	M5	M4

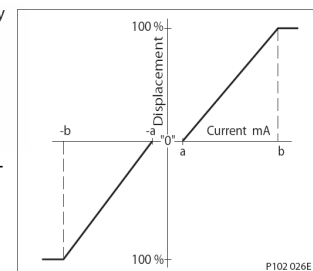
Pump output flow direction V's control current:
EDC using single or dual coils in series.

Maximum input current under any condition: 250 mA
PWM frequency: 200 Hz
Coil resistance at 24°C [75°F]:
A-B coil 20 Ω
C-D coil 16 Ω



MS connector (option KA)
MS 3102C-14S-2P

Pump displacement vs. control current



Coil configuration	A mA	B mA	Pin Connections
Single coil	14 ± 5	85 ± 18	A&B or C&D
Dual coil in series	7 ± 3	43 ± 9	NOT ALLOWED w ith DVC 7
Dual coil in parallel	14 ± 5	85 ± 18	AC & BD



NON FEEDBACK PROPORTIONAL ELECTRIC CONTROL (NFPE):

The pump displacement is proportional to the solenoid current but is also influenced by the shaft speed and system pressure. This feature provides a power limiting function by reducing flow relative to pressure to avoid overload of the prime mover.

The NFPE option is intended as an automotive style option that when combined with the **epc-2** is a cost effective way of controlling the following applications:

- **Horse Power management - Anti-Stall - Engine over-speed protection - ramped flow control - creep mode.**

The NFPE requires a pulse-width-modulates (PWM) coil current to optimize the pump performance. The recommended PWM frequency is 200Hz (80Hz min) for best operation and minimal hysteresis.

Shaft Rotation	CW		CCW	
	A	B	A	B
Active solenoid	A	B	A	B
Port A flow	Out	In	In	Out
Port B flow	In	Out	Out	In
Servo Cylinder	M5	M4	M5	M4

Coil Voltage	Coil Ohms	Coil Current		
		Start	Min	Max
12V	5.5	~440mA	1290mA	1500mA
24V	21.6	~220mA	645mA	750mA

ELECTRIC PUMP CONTROL Response Time:

On all the configurations shown here, the time required for the pump output flow to change from zero to full flow (acceleration) or full flow to zero (deceleration) is a function of the size of the orifice in the control flow passage.

A range of orifice sizes is available for the Series 90 Electric Displacement Control to assist in matching the rate of swashplate response to the acceleration and deceleration requirements of the application. Testing should be carried out to determine the proper orifice selection for the desired response.

For more information on pump reference Sauer Danfoss catalog 520L0603 • Rev FD • December 2009

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