# N122-001 Series
Servoamplifier with Oscillator/Demodulator

DESCRIPTION

The N122-001 Servoamplifier with Oscillator/Demodulator is specifically designed for use with systems that have three-stage servovalves using LVDT's as spool position feedback sensors. The card contains the excitation/demodulation necessary to close the inner loop of the servovalve spool, while providing PID control for the outer loop servoamplifier section. The card can be reconfigured, by jumper selection, for closed-loop position control systems that use LVDT's as position sensors and two-stage servovalves.
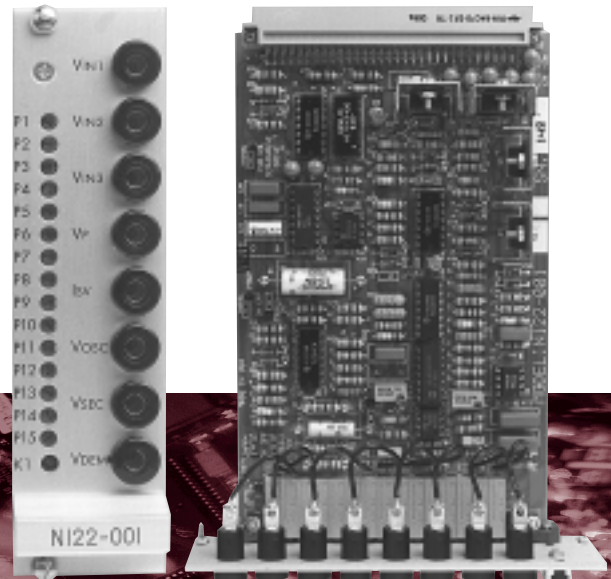
Features

- Closed-loop control of three-stage servovalves with LVDT position sensors.
- Outer loop PID control-jumper selectable, independent gain potentiometers.
- Current limiter (rate limit control possible).
- Inner loop gain potentiometer.
- Convenient front panel test points and potentiometers for easy field calibration.

Adjustments

P1   Trim: Changes authority of signal on terminal 7. Turn CW to reduce authority. Adjust to provide scaling of input at terminal 7.

P2   Bias: Changes bias voltage at input (summing) stage. Turn CW for positive input bias voltage. Adjust for desired offset between command and feedback.

P3   P-Gain: Changes proportional gain of input (summing) stage. Turn CW to increase gain. Adjust for system stability.

P4   I-Gain: Changes integral gain if jumper I is on. Turn CW to increase gain. Adjust for system stability.

P5   D-Filter Frequency: Changes corner frequency of low-pass filter on differentiator. Turn CW to increase frequency. Adjust to reduce excessive noise.

P6   D- Gain: Changes derivative gain if jumper D is on. Turn CW to decrease gain. Adjust to add phase lead.

P7   Dither Frequency: Turn CW to increase frequency. Adjust for a frequency appropriate for system dynamics.

P8   Dither Amplitude: Turn CW to increase amplitude. Adjust for desired dither current amplitude, typically ± 10% of rated current. Note: jumper DITHER must be on.

P9   Current Limit: Adjust maximum output current. Turn CW to increase.

P10 Inner Loop Gain: Adjust inner loop gain if three-stage valve is being used. Turn CW to increase gain. Adjust for stable operation. Jumper 7 off for three-stage valve operation. Jumper 7 on for unity gain on inner loop.

P11 Exciter Frequency: Changes frequency of excitation voltage at terminal 19. Turn CW to increase frequency. Adjust for desired excitation frequency.

P12 Demodulator Phase: Adjusts sample and hold timing to primary oscillator. Adjusts for maximum output at terminal 9. Turn CW for lead, turn CCW for lag. Set full CCW for operation ≤ 3 kHz.

P13 Exciter Amplitude: Changes amplitude of excitation voltage at terminal 19. Turn CW to increase amplitude. Adjust for desired excitation amplitude.

P14 Demodulator Span: Changes span of dc output at terminal 9. Turn CW to increase gain. Adjust for desired scale factor (volts/inch).

P15 Demodulator Zero: Changes offset of dc output at terminal 9. Turn CW to shift output in the negative direction. Adjust for zero Vdc at desired transducer position.

SPECIFICATIONS

Servoamplifier

Servovalve Drive:	± 100 mA into 100Ω
Proportional Gain:	5 to 300 mA/V
Integral Gain:	8 to 4000 mA/V-sec
Differential Gain:	0.04 to 4 mA-sec/V
Inner Loop Gain:	10 to 200 mA/V

Exciter

Frequency:	100 to 2500 Hz
Amplitude:	2 to 11 Vpp
Stability:	≤ 250 ppm amplitude/°C

Demodulator

Ripple:	< 40 mV p-p at the excitation frequency
Linearity:	≤ ± 0.2% at 1.2 kHz
Stability:	± 250 ppm gain/°C; ± 0.01 mV/°C
Gain:	1 to 10 Vdc/V p-p typical, varies with transducer characteristics
Frequency Response:	Linear from 0 to 180° as a function of excitation frequency
Temperature Range:	0°C to 50°C (32°F to 122°F)
Form Factor:	Eurocard 100 x 160 mm, 7HP, 3 U
Weight:	0.5 lb.

SCHEMATIC

Notes:

1. ⊕ Indicates test points located on front panel.

2. CAUTION: Perform adjustments with hydraulic system off. Before applying power to any cards, disconnect the servovalves. They should not be connected until current limit has been set.

3. An "extender card" is highly recommended to gain access to test points and adjustments while cards are powered-up within a eurocard rack assembly. (Moog ref P/N A81750-1)

4. Operating points on ends of 'LVDT' coils will become increasingly non-linear and should be avoided. An operating range over the ± span of the LVDT core adjustment must be made to achieve optimum linear performance results.
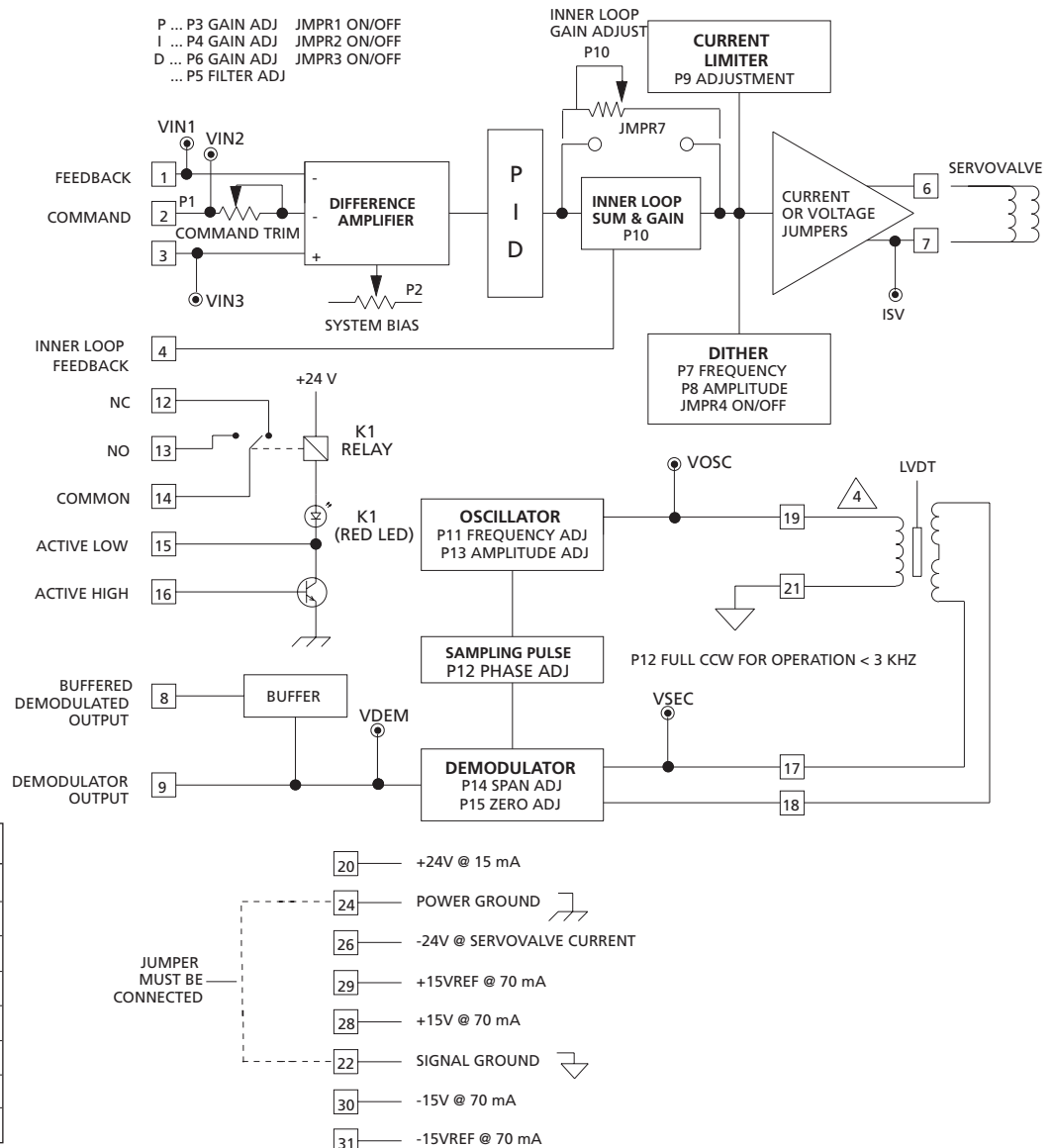
PCB TEST POINT	FRONT PANEL
TP1	VIN1
TP2	VIN2
TP3	VIN3
TP4	VP
TP5	ISV
TP6	VOSC
TP7	VSEC
TP8	VDEM

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