

# MOOG

## N123-135 Series

### Snap Trac

### Dual Signal Conditioner

#### SPECIFICATIONS

##### Inputs:

Two differential inputs; one across terminals 6-7, another across terminals 9-10.

Input signals may range from  $\pm 0.01$  to  $\pm 1.0$  VDC.

Input source impedance  $< 1K\Omega$ .

One single-ended input at terminal 3.

Insert R13 ( $10K\Omega \leq R13 \leq 1.0 M\Omega$ ).

##### Outputs:

Summed signal outputs at terminals 1 and 2.

Outputs from individual differential inputs at terminals 4 and 5.

Maximum output signals  $\leq \pm 10$  VDC.

Minimum load impedance  $\geq 5K\Omega$  each.

##### Frequency Response:

$< -3$ dB down at 1600 Hz

( $45^\circ$  at  $\approx 1250$  Hz).

##### Drift:

(for each output as referred to its input)

$< 2.4\mu V/^\circ C$  over temperature range  $0^\circ C$  to  $50^\circ C$ .

Long-term drift typically  $< 3\mu V$ /month.

##### Temperature Range:

$-20^\circ C$  to  $50^\circ C$  ( $-4^\circ F$  to  $122^\circ F$ )

##### Power Required:

$\pm 15$  VDC at  $\pm 22$  mA DC, regulated, 3-wire

( $\pm E$ ) at terminals 12, 13, and 14.

This power is available from Model N121-132A Snap Trac Servocontroller.

The N123-135 Snap Trac Signal Conditioner provides stable amplification for low level DC signals obtained from strain gage sensors such as load cells and pressure transducers. This dual-channel module provides two independent channels of signal conditioning with wide ranges of amplification and signal zero adjustments.

Provisions are included for summing the two signals with precision weighting. This may be used for an accurate force signal when sensing pressures of an unequal-area cylinder.

#### FEATURES

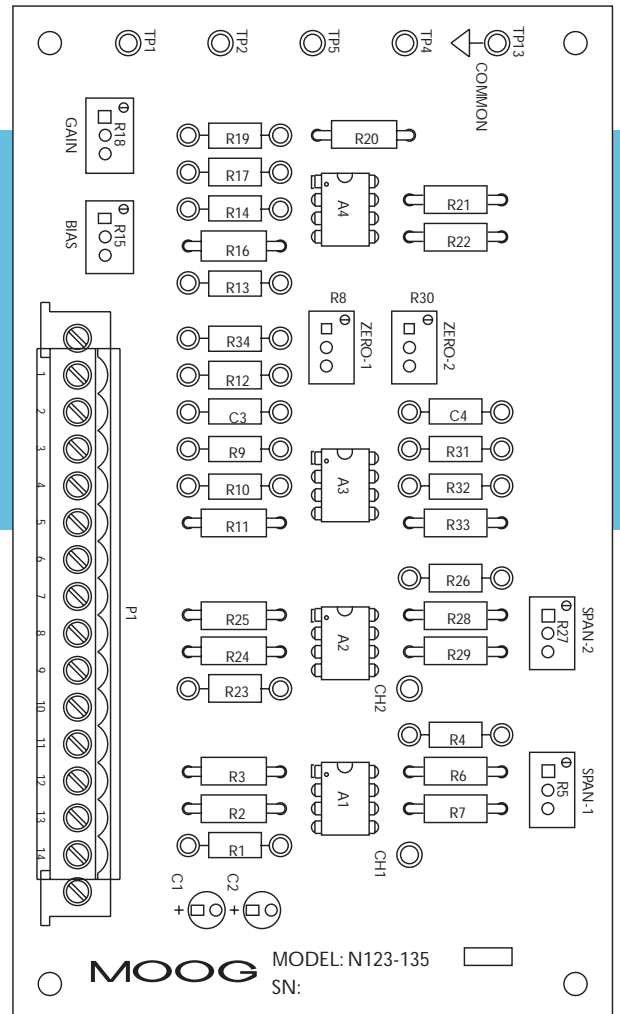
##### Construction

- Plug-in connectors for quick installation of board.
- Test points on all critical signals for easy system setup.
- Component standoffs on all user-configurable components.
- Twenty-turn potentiometers for all adjustable controls.
- Rugged construction with solder mask for reliability.

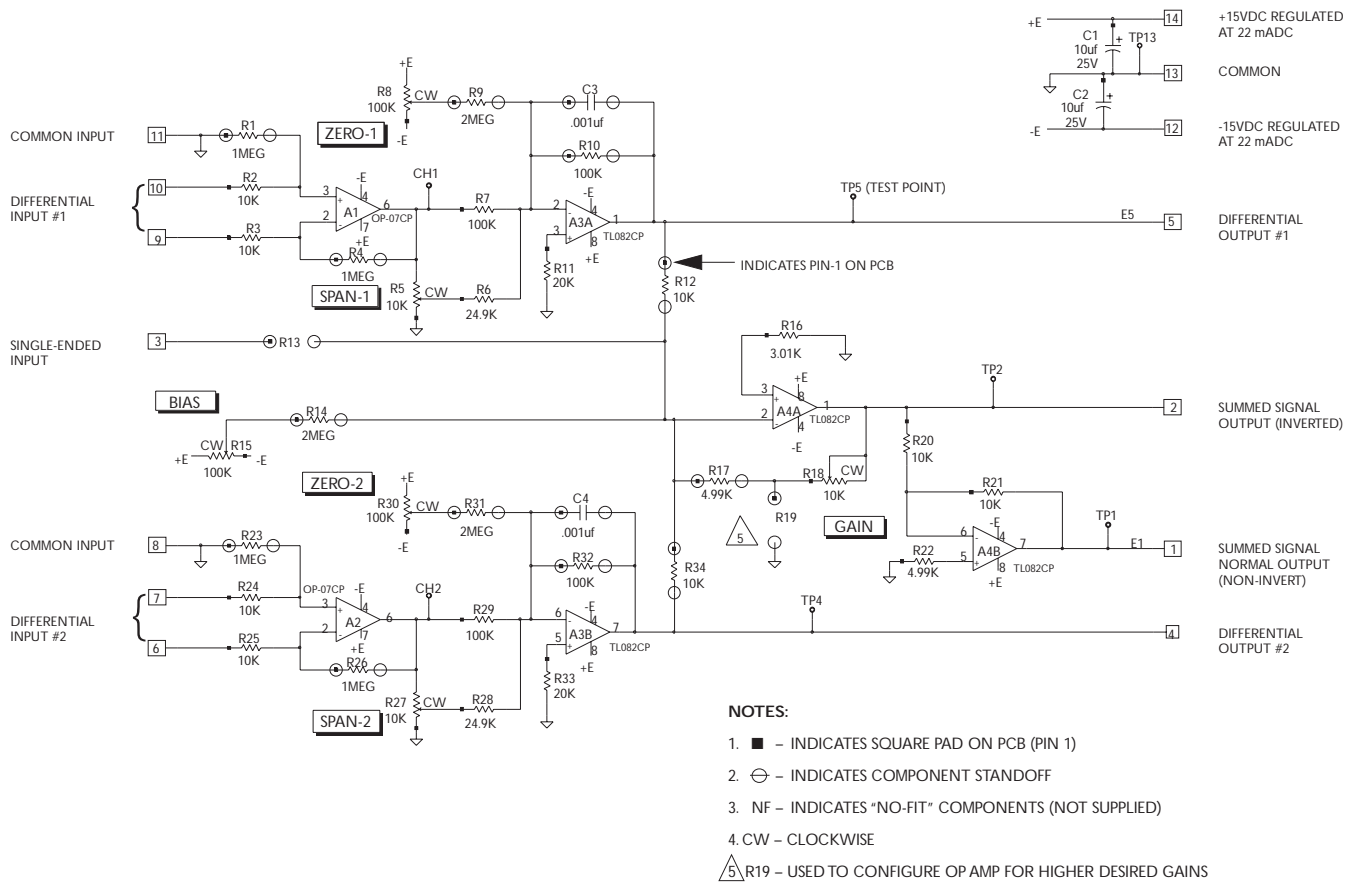
#### DIMENSIONS

3.25 in x 5.50 in long

Maximum Component Height: 0.69 in



# N123-135 DUAL SIGNAL CONDITIONER SCHEMATIC



- NOTES:**
- - INDICATES SQUARE PAD ON PCB (PIN 1)
  - ⊖ - INDICATES COMPONENT STANDOFF
  - NF - INDICATES "NO-FIT" COMPONENTS (NOT SUPPLIED)
  - CW - CLOCKWISE
  - R19 - USED TO CONFIGURE OP AMP FOR HIGHER DESIRED GAINS

## CIRCUITRY

One signal input is applied to terminals 6-7 and the other to terminals 9-10. Differential inputs are used to improve noise immunity and to allow several strain gage bridges to be excited from a common power source.

Output signals corresponding to each input are provided at terminals 4 and 5, respectively. Typical gains of output to input are 100 to 500 Volts/Volt. The two outputs are summed at amplifier stage A4A, having an inverted output at terminal 2 and normal output on terminal 1. The gain range of A4A is adjustable by R18 from 0.5 to 1.5 Volts/Volt. Higher gains can be obtained by inserting a suitable value of R19.

If e4 = rod end pressure and e5 = piston head pressure, then the signal at terminal 1 (e1) will be proportional to piston force when

$$\frac{R34}{R12} = \frac{\text{head end area}}{\text{rod end area}}$$

Select resistors from 10KΩ to 100KΩ.

BIAS potentiometer R15 provides zero output adjustment for terminals 1 and 2 when terminals 4 and 5 are zero. R13 may be inserted to give an additional input at terminal 3.

## ADJUSTMENTS

**ZERO 1 and 2** (R8 and R30) – adjust null of outputs for zero transducer conditions (e.g. zero pressure).

**SPAN 1 and 2** (R5 and R27) – adjust gain to set maximum signal sensitivities (e.g. +10 VDC outputs for maximum pressure).

**GAIN** (R18) – adjusts gain to set sensitivity of summed signals (e.g. +10 VDC for maximum differential pressure across piston).

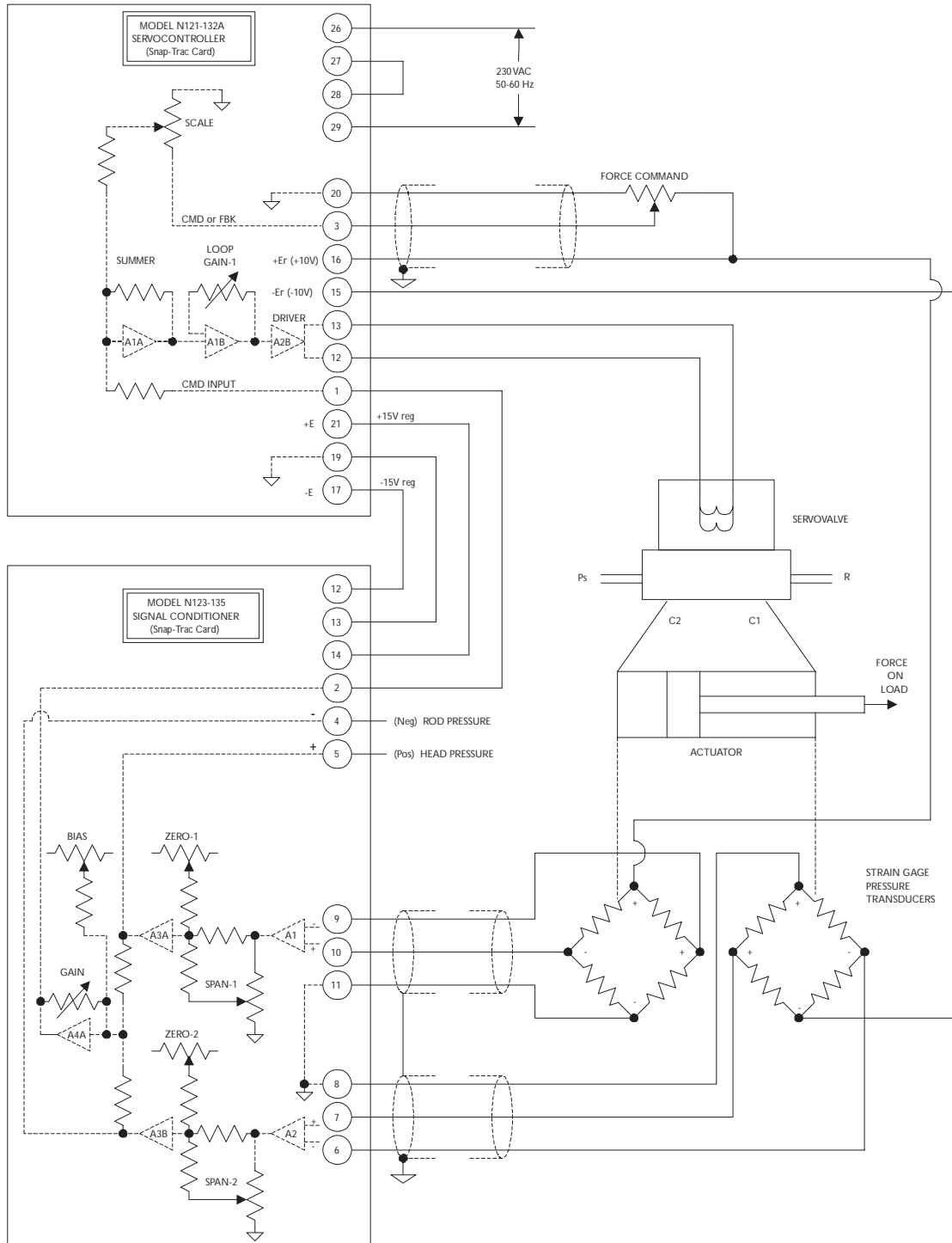
**BIAS** (R15) – adjusts bias of summed signals.

## MOUNTING:

Mount using Curtiss type TR-3 plastic track (Moog P/N 65419-1)

## FORCE SERVO WITH UNBALANCED ACTUATOR

Model N123-135 Dual Signal Conditioning Amplifier Card can be used to process pressure signals to obtain a force feedback signal from an unequal area actuator. Strain-gage type pressure transducers are often used in such applications. The Signal Conditioning Amplifier provides stable amplification of the millivolt-level strain-gage outputs. DC voltmeters can be connected to Terminal 4 & 5 to give visual indication of hydraulic pressure.



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