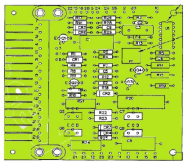
Danfoss KE03101 DC Position Level Amplifier



Danfoss KE03101 DC Position Level Amplifier User Guide

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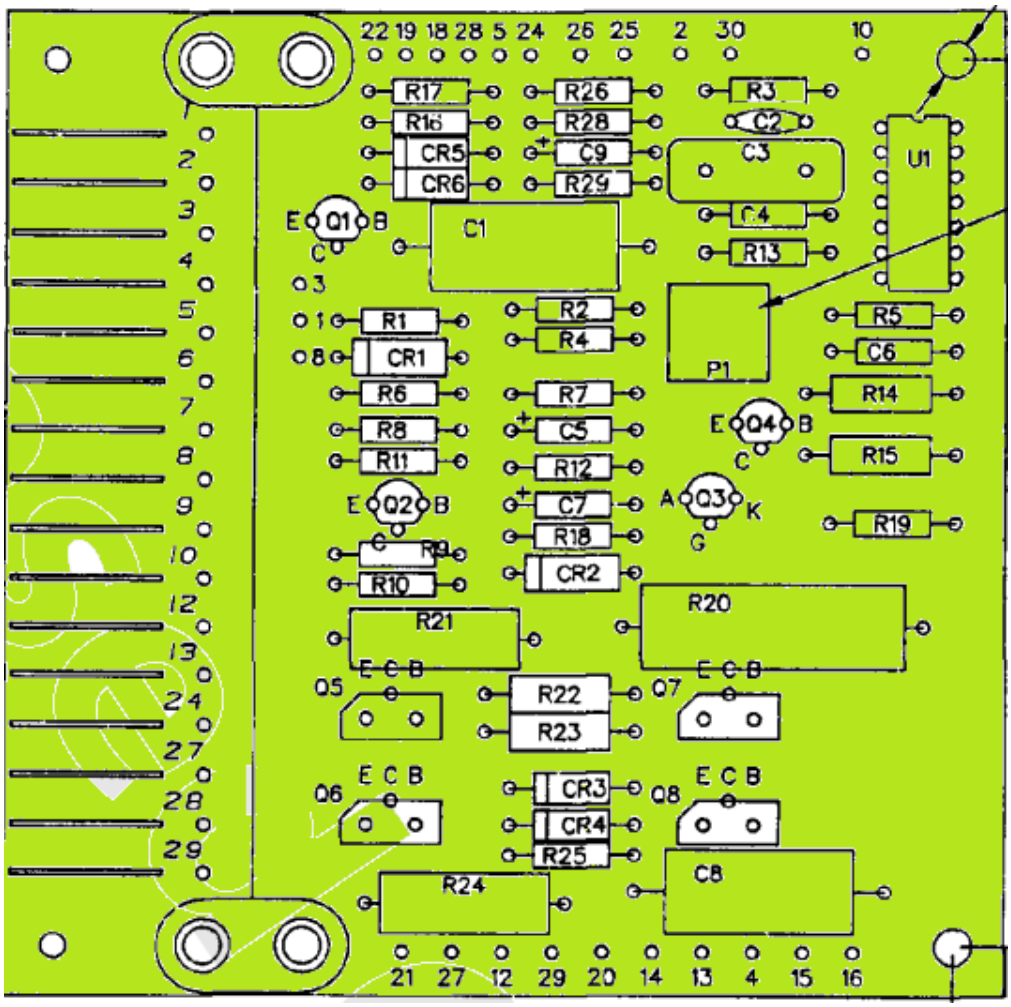


Product Information

Specifications

- **Operating Voltage:** 11V to 15V
- **Power Consumption:** 0.5-amp maximum
- **Voltage Output:** Sensor voltage
- **Electrical Connection:** 12-pin Elco Varicon connector 0.20-inch center
- **Mating Connector:** Danfoss part number K01519

Description

The KE03 amplifier is designed to accept millivolt DC signals and drive a two-wire torque motor bidirectionally proportional to the magnitude and polarity of the input signal. It provides a regulated DC voltage for sensor excitation, making it suitable for mobile applications where deviations in machine position need to be detected and corrected.

Theory of Operation

The input stage compares the sensor voltage with a reference voltage and amplifies the difference. The amplifier stage then sums the error signal with a variable amplitude 400Hz signal to create a dynamic balance in the output. The amplifier output drives the power stage, producing a pulse width output that delivers power to the load based on the error signal.

Mouting Dimensions

Dimensions of the KE03 in Millimeters (Inches).

Customer Service

NORTH AMERICA

ORDER FROM

- Danfoss (US) Company Customer Service Department
- 3500 Annapolis Lane North
- Minneapolis, Minnesota 55447
- Phone: (763) 509-2084
- Fax: (763) 559-0108

Product Usage Instructions

Electrical Connection

The KE03 amplifier is connected using a 12-pin Elco Varicon connector with 0.20-inch center spacing. The mating connector required is the Danfoss part number K01519.

Sensor Voltage Setup

The amplifier provides 6-Vdc to a potentiometer sensor such as the ACX104B. Ensure that the sensor is properly connected and calibrated to provide accurate feedback to the amplifier.

Operation in Mobile Applications

For mobile applications, ensure that the sensor detects deviations in machine position accurately. Connect the servovalve, such as the MCV113, to the amplifier's output for proper correction of error signals.

Feedback Sensor Integration

In steering control applications, consider integrating a feedback sensor like the MCX103 to prevent over-correction. Properly connect and calibrate the feedback sensor to work in conjunction with the KE03 amplifier.

FAQ

Q: Can the KE03 amplifier be used with sensors other than potentiometers?

A: While the KE03 is optimized for use with potentiometer sensors like the ACX104B, it can potentially work with other compatible sensors with proper calibration and setup.

DESCRIPTION

The KE03 amplifier will accept a millivolt dc signal and drive a two-wire torque motor bidirectionally proportional to the magnitude and polarity of an input signal. A regulated dc voltage is provided for sensor excitation. For mobile

applications, the sensor detects deviations in the position of the machine with respect to a reference (i.e., gravity, stringline, etc.). The amplifier converts the deviation information into a proportional output to drive a servo valve such as the MCV113. The servo valve repositions the final drive element in the proper direction to eliminate the error signal. In steering control applications a feedback sensor, such as an MCX103, may also be needed to protect against over-correction.

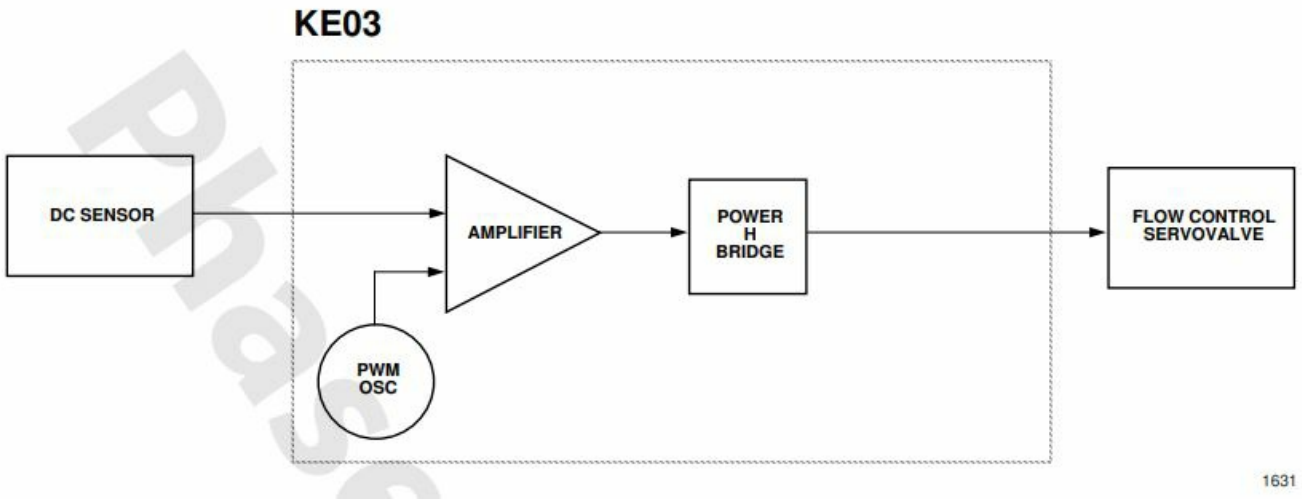
TECHNICAL DATA

- OPERATING VOLTAGE
  - 11-V to 15-V
- POWER CONSUMPTION
  - 0.5-amp maximum
- VOLTAGE OUTPUT
  - 0 to 5.8 ± 0.04-V with 12-Vdc supply voltage and a 33-
  - ohm, 0.5 heavy load 440 ± 40-Hz pulse width modulation
- SENSOR VOLTAGE
  - The amplifier provides 6-Vdc to a potentiometer sensor such as the ACX104B. Inputs to the amplifier KE03101 run at a common mode of 3-V. If the ACX104B is at centre with 6-V applied, the resultant 3-V input will balance the amplifier. Another amplifier version, the KE03102, runs at a common mode of 5-Vdc.
- GAIN ADJUSTMENTS
  - A ± 35-mVdc error signal will result in full output to a servo valve with maximum gain.
  - With minimum gain a ± 1-V signal is required for full output.
- ELECTRICAL CONNECTION
  - 12-pin Elco Varicon connector 0.20-inch center
- MATING CONNECTOR
  - Danfoss part number K01519

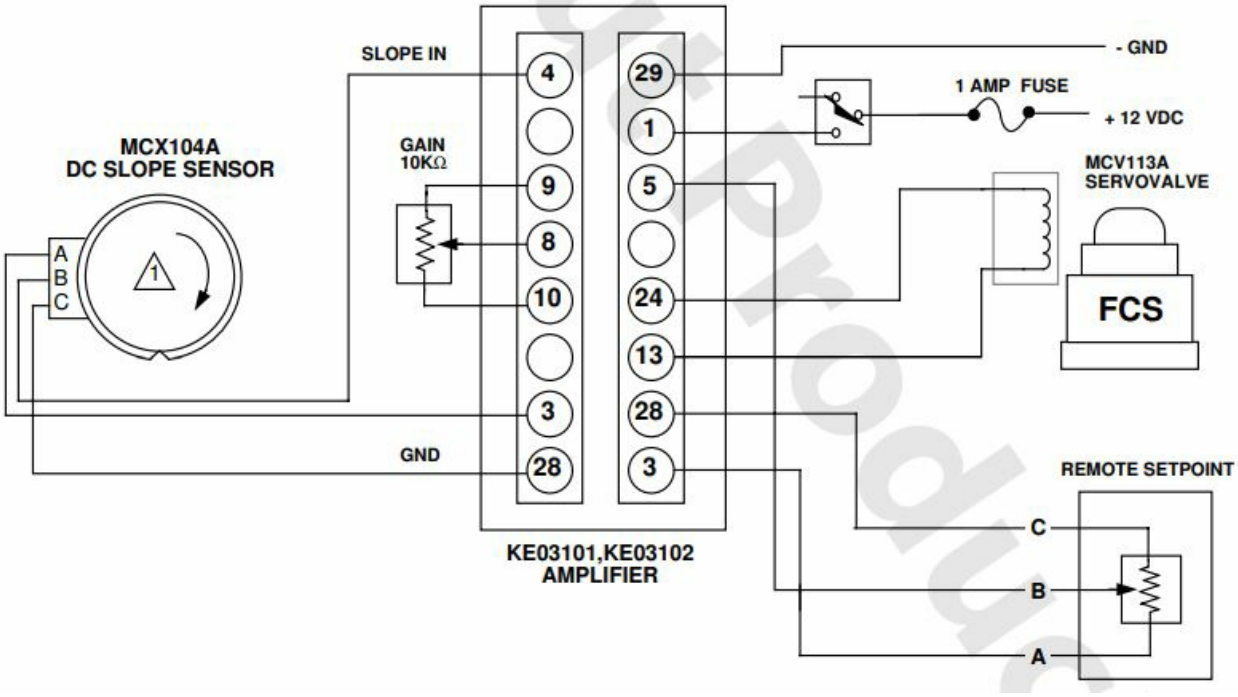
THEORY OF OPERATION

The input stage accepts a millivolt signal from the external sensor(s). The sensor voltage is compared to a reference voltage, and the difference is amplified. In the amplifier stage the dc error signal is summed with a variable amplitude 400- Hz signal, creating a dynamic balance between the two halves of the time-proportional output (power stage). An increased gain setting reduces the amount of error signal required to supply full drive to the valve. The amplifier output goes to the power drive stage, creating a pulse width output. The output signal provides both dither and drive current to the load at a rate of 440-Hz. With zero error signal, the drive in each direction will be equal, resulting in no net power delivered to the valve. With the introduction of an error signal, the drive in one direction will be on longer than the other, resulting in net power delivered to the valve.

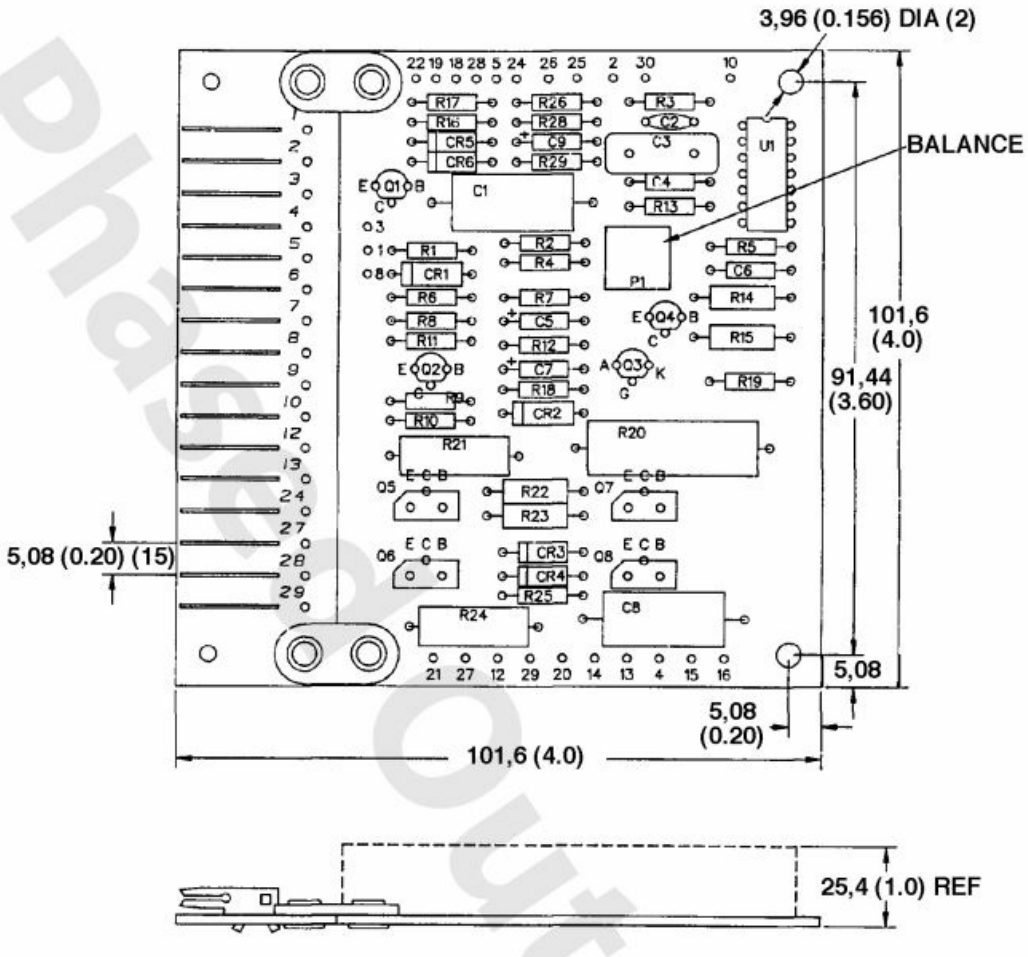
BLOCK DIAGRAM



CONNECTION DIAGRAM



MOUNTING DIMENSIONS



Dimensions of the KE03 in Millimeters (Inches).

CUSTOMER SERVICE

NORTH AMERICA

ORDER FROM

- Danfoss (US) Company
- Customer Service Department
- 3500 Annapolis Lane North
- Minneapolis, Minnesota 55447
- Phone: (763) 509-2084
- Fax: (763) 559-0108

DEVICE REPAIR

- For devices in need of repair or evaluation, include a
- description of the problem and what work you believe
- needs to be done, along with your name, address and
- telephone number.

RETURN TO

- Danfoss (US) Company
- Return Goods Department
- 3500 Annapolis Lane North
- Minneapolis, Minnesota 55447

EUROPE

ORDER FROM

- Danfoss (Neumünster) GmbH & Co.
- Order Entry Department
- Krokamp 35
- Postfach 2460
- D-24531 Neumünster
- Germany
- Phone: 49-4321-8710
- Fax: 49-4321-8711355

Documents / Resources

	Danfoss KE03101 DC Position Level Amplifier [pdf] User Guide KE03101 DC Position Level Amplifier, KE03101, DC Position Level Amplifier, Position Level Amplifier, Level Amplifier, Amplifier

References

- User Manual