

### DESCRIPTION

The R7232A Controller provides a means of converting a remote position sensor signal into a suitable output signal to drive a servovalve such as the Sauer-Danfoss MCV103/113. Typical sensors include the SB104A Rotary Position Sensor for grade or steering control applications and the KS10201 Level Sensor for slope control applications.

When used with mobile equipment, the sensor detects the equipment's deviation in position with respect to a reference. The R7232A Controller converts the deviation information into a pulse-width-modulated proportional output to command a two-wire servovalve. The servovalve moves a final drive element the proper direction and distance, eliminating the error signal.

The R7232A is designed to be mounted in a panel. A gain adjustment, a RUN/STANDBY switch, a JOG switch and a continuous display deviation meter are on the Controller's front panel for operator convenience.



### FEATURES

- Versatile - Models available with either MS or terminal strip connectors.
- Deviation Meter - Zero center meter shows direction and amount of servovalve drive.
- Resists vibration.
- Reverse polarity protection.
- Short circuit protection.
- Manual Override - A JOG switch provides manual commands to the servovalve.
- RUN/STANDBY Switch.
- Moisture Protection - Circuit board components coated to guard against corrosion.

### ORDERING INFORMATION

#### SPECIFY

1. Model number R7232A1010 (MS Connector).  
Model number R7232A1028 (Terminal Strip).
2. Sensors; KS10201 or SB104A
3. Valves; MCV103/113
4. Slope Set Unit; MCQ101
5. Mating cables and connectors needed.

#### MATING CONNECTORS

1. Mating MS connector to the Sensor connector (6 pin) - Bendix Type Number MS3106A-14S-6S, straight; Sauer-Danfoss Part Number K04185.
2. Mating MS connector to the Remote Setpoint Connector (5 pin) - Bendix Type Number MS3106A-16S-8S, straight; Sauer-Danfoss Part Number K03997.
3. Mating MS connector to the power and output connector (10 pin) - Bendix Type Number MS3106A-18-1S, straight; Sauer-Danfoss Part Number K03998.

# TECHNICAL DATA

## INPUT

### SUPPLY VOLTAGE

11 to 15 Volts dc

### POWER CONSUMPTION

Dependent on load, 4.5 watts maximum at 12 Volts dc.

### INPUT IMPEDANCE TO EACH BRIDGE DEMODULATOR

20 kilohms minimum

### MAXIMUM INPUT TO EACH BRIDGE DEMODULATOR

58 Volts peak to peak

### MAXIMUM DIFFERENTIAL INPUT

10 Volts peak to peak as seen at the Controller gain adjustment.

## OUTPUT

### POWER OUTPUT

0 to  $5.8 \pm 0.4$  Volts dc at 12 Volts dc supply voltage. Frequency of pulse width modulation is  $440 \pm 40$  Hz.

### POLARITY

An input error signal provides a higher voltage from Terminals C to D than from Terminals E to F on the sensor connector. The result is counterclockwise meter deviation and a positive average output of power connector Terminal C with respect to D.

### TRANSDUCER EXCITATION

Square wave at a frequency of  $440 \pm 40$  Hz. Nominal amplitude into a slope sensor (10 ohm load) is 1.7 Volts peak to peak, 1.4 Volts ac as read on a volt-ohmmeter. Nominal amplitude into a grade sensor (5 ohm load) is 1.0 Volts peak to peak, 0.7 Volts ac as read on a volt-ohmmeter.

## CONTROL

### RUN/STANDBY SWITCH

Located on the front panel. In the RUN position, the output is proportional to the sensor error signal. In the STANDBY position, the output of the R7232A is switched off.

### JOG SWITCH

Located on the front panel. Spring return to open center position.

*NOTE: The JOG switch overrides the sensor signal and provides manual operation of the valve regardless of the RUN/STANDBY switch position.*

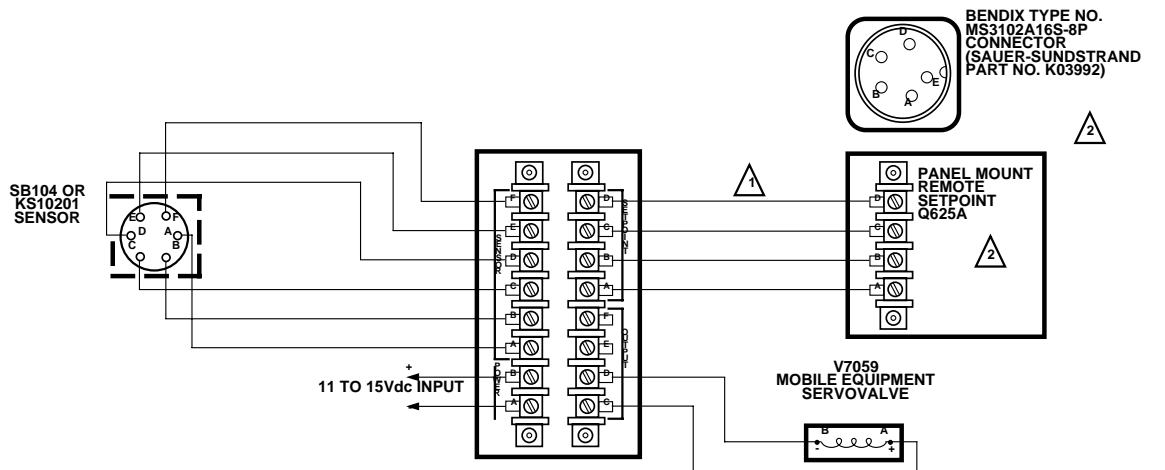
### METER

Located on the front panel. Displays output of the Controller. The output may or may not be connected to the load, depending upon the RUN/STANDBY switch position. With the switch in the STANDBY position, the meter will continue to indicate errors generated by the sensor. Scale - Zero drive is at midscale. Needle in the red indicates output greater than 3 Volts dc.

### GAIN

The gain potentiometer is located on the front panel and is field adjustable. A 50 millivolt dc error signal across the gain potentiometer (P2) when the potentiometer is in full clockwise position will give  $5.8 \pm 0.4$  Volts dc to the load. Clockwise rotation increases gain. Shaft rotation is  $270^\circ$ . If the gain potentiometer is rotated counterclockwise to its stop, the Controllers will be turned OFF.

## CONNECTION DIAGRAM



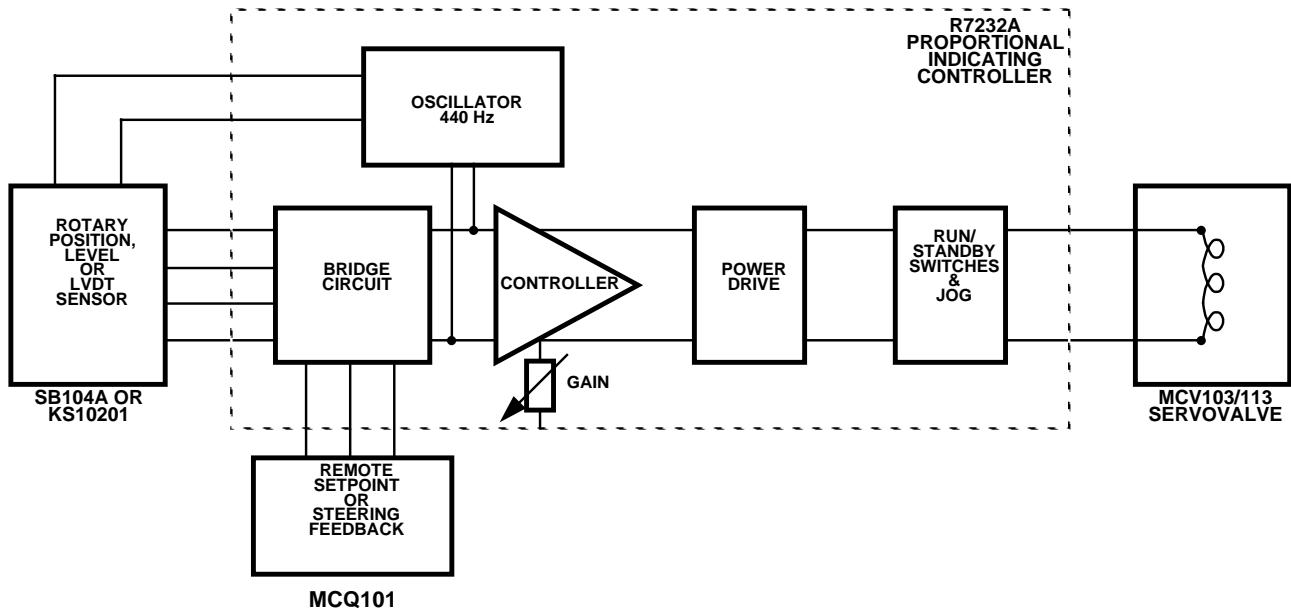
1 WIRING FROM D TO D IS NEEDED ONLY WHERE THE REMOTE SETPOINT IS EQUIPPED WITH A POLL-OFF CIRCUIT

2 IF A HAND-HELD REMOTE SETPOINT Q625 IS USED, CONNECT THE AMPLIFIER TO A BENDIX TYPE NO. MS3102A16S-8P, A, B, C, D, TO A, B, C, D RESPECTIVELY AND MOUNT ON THE PANEL.

Wiring Connections to the R7232 Terminal Strips

358C

## BOCK DIAGRAM



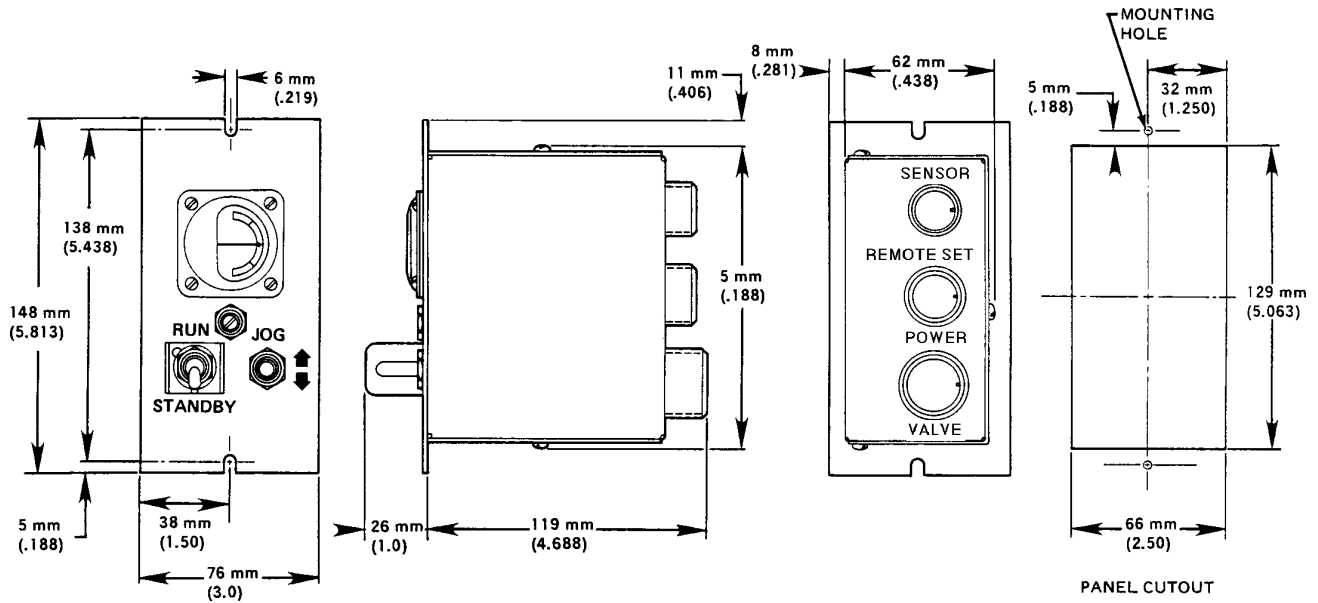
718C

## THEORY OF OPERATION

Refer to the Block Diagram. Power is obtained from the equipment's 12 volt DC system. Four basic sections comprise the internal circuitry of the R7232A. They are as follows:

- 1. OSCILLATOR**  
The oscillator provides sensor excitation. In addition, the oscillator supplies an input to the Amplifier, setting the frequency of the output.
- 2. BRIDGE**  
The bridge accepts the floating AC signals from the single external sensor and rectifies the signals. The DC signal is split with a fixed voltage divider within the total bridge network. The difference, or error signal, is supplied to the Amplifier. In slope control applications, a Remote Setpoint (Q625A) is connected across the fixed voltage divider. Changing the setpoint of the Q625A changes the bridge ratio and calls for a new null point for the sensor.
- 3. SENSOR**  
The DC error signal from the bridge is summed with the 440 Hz signal from the oscillator to form the Amplifier input. The Amplifier is affected by three adjustments: an internal balance potentiometer, an internal range potentiometer and an external gain potentiometer. The output of the Amplifier operates the power drive.
- 4. POWER DRIVE**  
The Amplifier output goes to the power drive operating servovalve as a pulse width system. The output signal provides both "dither" and power to the load at a rate of 440 Hz. With zero bridge error signal, the drive in each direction will be equal, resulting in no net power delivered to the final drive element. With the introduction of a bridge error signal, the drive in one direction will be longer than the other resulting in net power delivered to the final drive element.

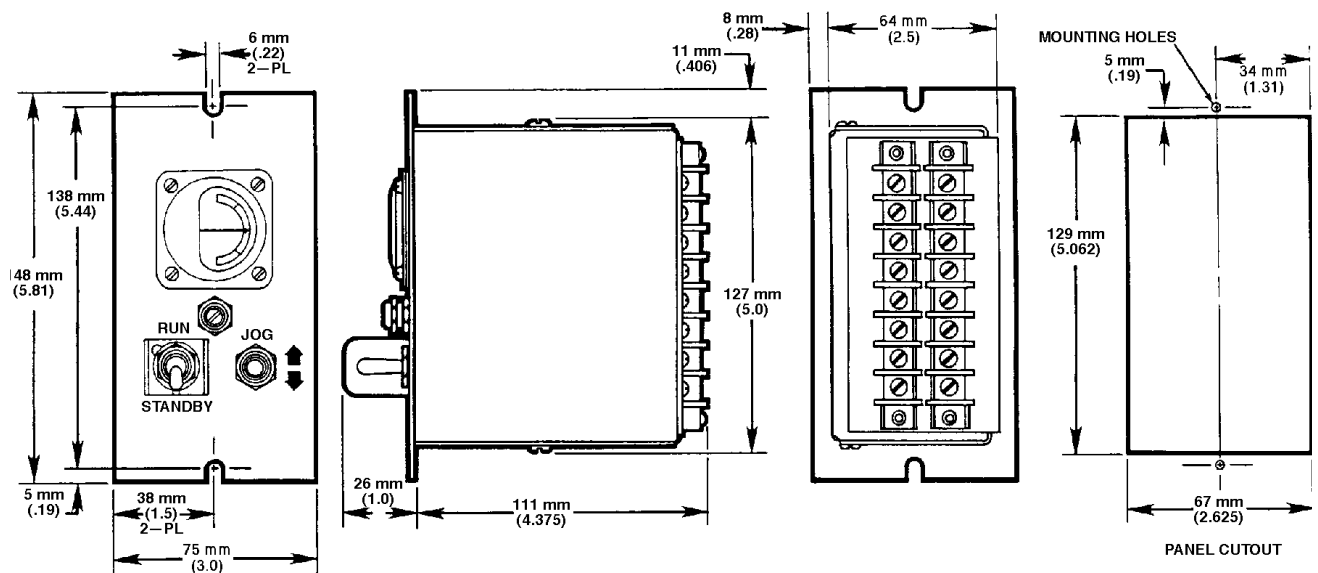
## DIMENSIONS, MS CONNECTORS



712C

Dimensions and Panel Cutout Size of the R7232A With MS Connectors in Millimeters (Inches).

## DIMENSIONS, TERMINAL STRIPS



292A

Dimensions and Panel Cutout Size of the R7232A With Terminal Strips in Millimeters (Inches).

## **CUSTOMER SERVICE**

### **NORTH AMERICA**

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#### **ORDER FROM**

Sauer-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**

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

### **EUROPE**

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#### **ORDER FROM**

Sauer-Danfoss (Neumünster) GmbH & Co.  
Order Entry Department  
Krokamp 35  
Postfach 2460  
D-24531 Neumünster  
Germany  
Phone: 49-4321-8710  
Fax: 49-4321-871-184