

## DESCRIPTION

The MC200 microcontroller is an environmentally-hardened device designed to act as a stand-alone controller for small to medium sized mobile machine control systems. Its primary application is as a dual axis valve driver used in conjunction with the JS series of electronic joystick, but it is also an ideal platform for software applications such as simple open loop dual path drive control and hydrostatic transmission automotive control with pump and motor electronic phasing.

The MC200 consists of a circuit board assembly inside a rugged die-cast zinc housing. The controller can interface with a wide variety of input devices including potentiometers, Hall-effect sensors, pressure sensors, pulse pickups and encoders and has output options that interface with high current proportional solenoid valves and low current pressure control pilot servo valves.

*Standard*, preprogrammed application solution software, called SauerPersonalities, make the MC200 a cost effective solution for OEMs wishing to replace analog controls or to introduce microelectronic controls on their machines. SauerPersonalities are available for most common machine control applications, isolating OEMs from the need to write application software code. SauerPersonalities are readily tailored to specific machines by changing application tuning parameters through the use of WebGPI graphical set-up



software. Specifically, the joystick characterization personality allows for the adjustability of parameters such as output thresholds, maximum currents, PWM frequency, ramping and input profiling.

The MC200 is also an extremely cost effective platform for machine control solutions requiring software engineered for a specific machine. EEPROM memory allows engineered application software code and tuning parameters to be changed in the field using WebGPI.

## FEATURES

- Robust electronics operate over a range of 9 to 32 volts with reverse battery, negative transient and load dump protection
- Environmentally hardened design including coated die cast zinc housing that withstands harsh mobile machine operating conditions including shock, vibration EMI/RFI, high pressure washdown, temperature and humidity extremes
- Compact footprint
- Motorola 8 bit H68HC908AZ60 microprocessor
- Versatile I/O—Hardware configurable inputs and outputs
- Standard Sauer-Danfoss (4) LED configuration for diagnostics
- EEPROM memory allows factory shipment of pre-programmed SauerPersonalities or field programming of engineered application software and tuning parameters
- SauerKernel operating system facilitates application software transportability across Sauer-Sundstrand micro electronic platforms
- RS232 communications for WebGPI user interface

## APPLICATION SOFTWARE

MC200 is designed to run SauerPersonalities or control solution software engineered for a specific machine. Consult

Sauer-Danfoss Customer Service for a list of available SauerPersonalities.

## ORDERING AND REPAIR INFORMATION

The MC200 ordering part number designates both hardware and application software. The software component includes both application software (SauerPersonalities or Engineered) and tuning parameters associated with the application. For complete product ordering information, including part number, consult Sauer-Danfoss Customer Service.

The MC200 is not repairable and must be replaced if a failure occurs. Consult Sauer-Danfoss Customer Service for replacement part information.

## RELATED LITERATURE

### SAUERPERSONALITY USER'S MANUALS

Each SauerPersonality User's Manual includes necessary information required to apply, start-up and provide diagnostic support for a specific personality.

## TECHNICAL DATA

### POWER SUPPLY

9-36 Vdc  
Power consumption: 2 W (With Valve Outputs Off)

### SENSOR POWER SUPPLY

Internal 5Vdc regulator for external sensor power (0.03 A, max)

### INPUTS

- (3) GENERAL PURPOSE SWITCHING DIGITAL INPUTS  
Hardware configurable to be switch to ground or switch to batt+  
Input resistance: 15 Kohm  $\pm$ 5%  
Pull-up resistance: 15 Kohm  $\pm$ 5%
- (3) 0-5 VDC GENERAL PURPOSE ANALOG INPUTS  
8 bit resolution
- (2) 0-5 VDC ANALOG OR TIMING INPUT  
Hardware configurable to be PPU input or analog input  
If configured as a PPU input, can be biased to +5 Vdc or to ground  
PPU Count frequency: 1-6000 HZ

### OUTPUTS

- (4) HIGH SIDE PROPORTIONAL PWM VALVE DRIVERS WITH INTERNAL CURRENT FEEDBACK (2.5A MAX)  
Configured in 2 pairs - only 2 available at one time  
Feedback sample resistor (output max. current) is hardware configurable  
Software configurable PWM frequency from 33 to 200 Hz

### COMMUNICATION

RS232

### LEDs

- (1) Green system power indicator
- (1) Green 5Vdc power indicator
- (1) Yellow mode indicator (software configurable)
- (1) Red status indicator (software configurable)

### CONNECTOR

18 pin MetriPack connector

### MATING CONNECTOR BAG ASSEMBLY

Sauer-Sundstrand part number K23334

### ENVIRONMENTAL

#### OPERATING TEMPERATURE

-40° C to + 70° C (-40° F to 158° F)

#### MOISTURE

Protected against 95% relative humidity, high pressure wash downs and salt spray

#### VIBRATION

5 to 2000Hz with resonant dwell for 1 million cycles for each resonant point run from 1 to 10 Gs

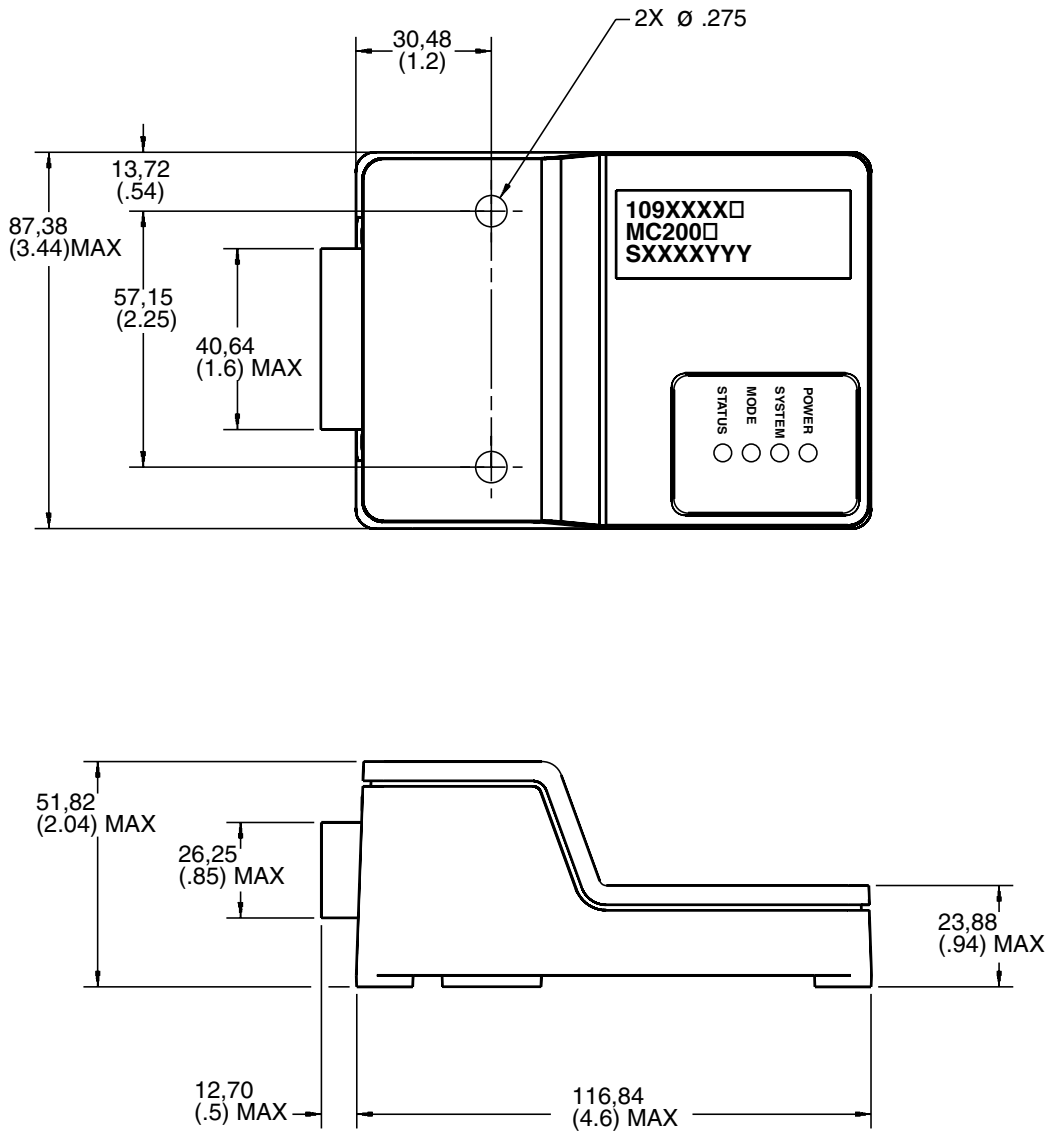
#### SHOCK

50 Gs for 11 ms in all three axes for a total of 18 shocks

#### EMI/RFI

100V/M in range of 1 MHz to 1 GHz

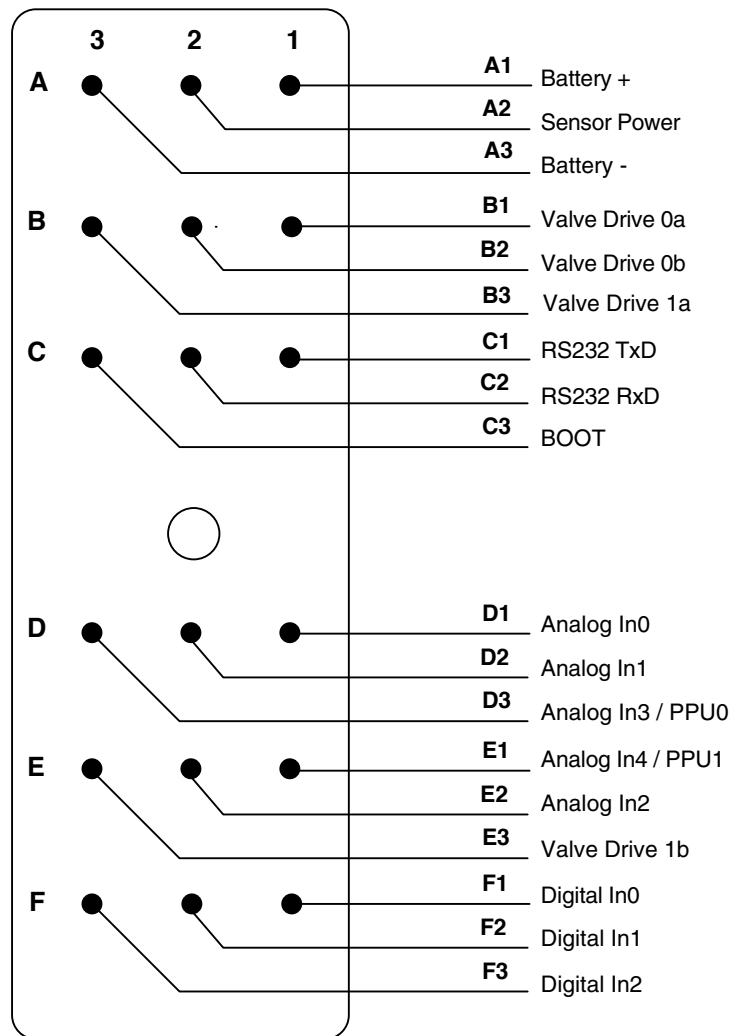
# DIMENSIONS



3022

Dimensions of the MC200 Microcontroller in Millimeters (Inches).

## CONNECTOR PINOUTS



3023

## MACHINE WIRING GUIDELINES

- All wires must be protected from mechanical abuse. Wire can be run in flexible metal or plastic conduits.
- Use 85° C wire with abrasion resistant insulation. 105° C wire should be considered near hot surfaces.
- Use 18AWG wire.
- Separate high current wires such as solenoids, lights, alternators or fuel pumps from control wires.
- Run wires along the inside of, or close to, metal machine frame surfaces where possible. This simulates a shield which will minimize the effects of EMI/RFI radiation.
- Do not run wires near sharp metal corners. Consider running the wire through a grommet when rounding a corner.
- Do not run wires near hot machine members.
- Provide strain relief for all wires.
- Avoid running wires near moving or vibrating components.
- Avoid long, unsupported wire spans.
- All sensors and valve drive circuit grounds should be wired to a common terminal. Separate chassis grounds can lead to erratic functionality.
- Sensor lines should be twisted about one turn every 10 cm (4 inches).
- It is better to use wire harness anchors that will allow wires to float with respect to the machine frame rather than rigid anchors.

## 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**

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D-24531 Neumünster  
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