

## PLUS+1™ MC012-020, 022, 026, 029 Controllers

### Mobile Machine Management

MC012-020, 022, 026, 029 controllers are elements of the flexible, powerful, expandable, and affordable PLUS+1 family of mobile machine management products. All four devices are general-purpose controllers that are equally suited for use as members of a distributed machine control system, with intelligence in every node, or as stand-alone controllers.

### Product Highlights

All four controllers employ a Digital Signal Processor (DSP) providing the controllers with extremely fast single cycle processing speed and 128K internal flash. All four controllers feature multifunction input pins that are capable of receiving inputs from RTD temperature sensors. MC012-026 and MC012-029 have a maximum operating temperature of 105°C (221°F). The MC012-022 and MC012-029 have an application key that enables the use of Sauer-Danfoss developed GUIDE machine control solutions. The same GUIDE HWD file is used with all four controllers.

### Application Development

Users develop all four controller's applications using PLUS+1 GUIDE. This Microsoft® Windows® based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/ diagnostic tool.

Local Address:



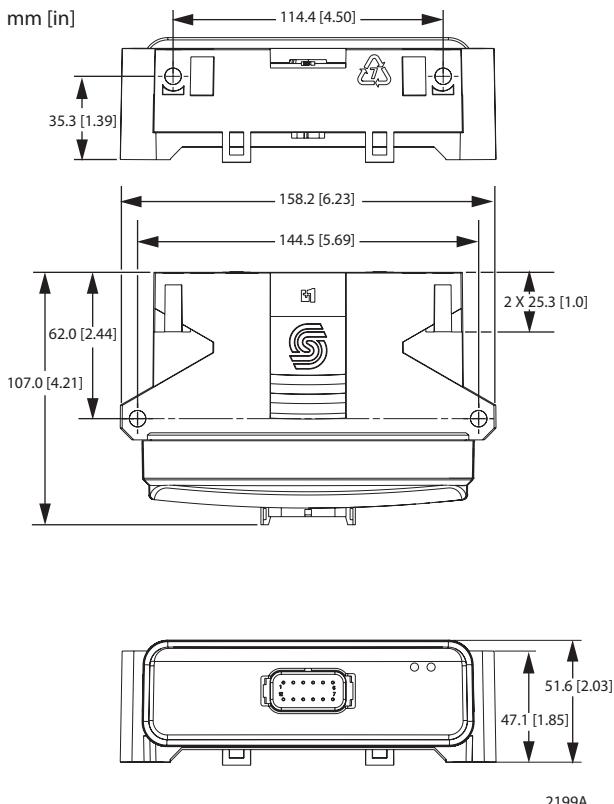
**PLUS+1™**  
by SAUER-DANFOSS

*MC012-020, 022, 026, 029 Controllers*

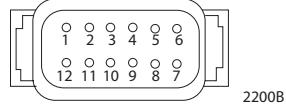
### Features

- User-programmable with PLUS+1 GUIDE (Graphical User Integrated Development Environment)
- MC012-026 and MC012-029 have a maximum operating temperature of 105°C (221°F)
- 32 bit fixed-point DSP running at 150 MHz
  - 12 bit analog-to-digital converter
  - 16 bit timers/counters
- 12 pin Deutsch® DTM connector
- 4 inputs
  - (3) universal (DIN/AIN/FreqIN/Rheo) that are user-defined as either:
    - Analog:* with configurable ranges 0 to 5.25 Vdc (with over range protection) or 0 to 36 Vdc;
    - Digital:* pull up (5 Vdc), pull down (0 Vdc) or pull to center (2.5 Vdc);
    - Frequency (timing):* 1 Hz to 10 kHz
    - Resistance:* 0 to 10,000 ohm
  - (1) fixed range analog (AIN/CAN shield) 0 to 5.25 Vdc or CAN shield pin
- 2 outputs
  - (2) universal (PWMOUT/DOUT/PVGOUT) that are user-defined as either:
    - Digital:* (3 A), configurable as source or sink;
    - PWM:* (30 to 4000 Hz), configurable as open or closed loop with current control;
    - Analog voltage:* open loop PWM at 4000 Hz
  - Any PWMOUT/DOUT/PVGOUT can be used to provide reference power to one PVG valve
- 9 to 36 Vdc power supply, monitored internally
- 1 CAN 2.0 B port; the fixed range analog (AIN/CAN shield) may be configured as a shield pin
- Power supply for external sensors rated at 5 Vdc to 100 mA and regulated internally
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- MC012-022 and MC012-029 controllers contain the application key required to run Sauer-Danfoss developed machine control application software
- CE compliant

### Mounting Dimensions and Pin Assignments



#### 12 Pin Connector



2200B

#### Connector

Pin	Controller function
C1-P1	Power ground -
C1-P2	Power supply +
C1-P3	CAN +
C1-P4	CAN -
C1-P5	AIN/CAN shield
C1-P6	5 Vdc sensor power +
C1-P7	Sensor power ground -
C1-P8	DIN/AIN/FreqIN/Rheo
C1-P9	DIN/AIN/FreqIN/Rheo
C1-P10	DIN/AIN/FreqIN/Rheo
C1-P11	PWMOUT/DOUT/PVGOUT
C1-P12	PWMOUT/DOUT/PVGOUT

Use care when wiring mating connector. Above pinouts are for device pins.

#### Caution

This device is not field serviceable. Opening the device housing voids the warranty.

### Specifications

<b>Supply voltage</b>	9 to 36 Vdc
<b>Operating temperature (ambient)</b> <b>MC012-020, MC012-022</b>	-40°C to 70°C [-40°F to 158°F]
<b>Operating temperature (ambient)</b> <b>MC012-026, MC012-029</b>	-40°C to 105°C [-40°F to 221°F]
<b>Storage temperature</b> <b>MC012-020, MC012-022</b>	-40°C to 85°C [-40°F to 185°F]
<b>Storage temperature</b> <b>MC012-026, MC012-029</b>	-40°C to 105°C [-40°F to 221°F]
<b>Programming temperature</b>	0°C to 70°C [32°F to 158°F]
<b>IP rating</b> (with mating connector attached)	IP 67
<b>EMI/ RFI rating</b>	100 V/M
<b>Weight</b>	0.40 kg [0.88 lb]
<b>Vibration</b>	IEC 60068-2-64
<b>Shock</b>	IEC 60068-2-27 test Ea
<b>Maximum current, sourcing</b>	8 A
<b>Maximum current, sinking</b>	8 A

### Ordering Information

<b>MC012-020 part number</b>	11085514
<b>MC012-022 part number</b>	11085515
<b>MC012-026 part number</b>	11075252
<b>MC012-029 part number</b>	11075253

Related product	Sauer-Danfoss part numbers	
CG150 CAN/USB Gateway	10104136	
Deutsch® mating connector bag assembly	10102025 (16 to 20 AWG)	10100944 (20 to 24 AWG)
PLUS+1 GUIDE single user license	10101000	

Sauer-Danfoss comprehensive technical information **PLUS+1 Controller Family Technical Information, 520L0719** and **MC012-020, 022, 026 and 029 Application Program Interface (API) Document** are on line at: [www.sauer-danfoss.com](http://www.sauer-danfoss.com) and/or embedded in product HWD file.