

Data Sheet

# PLUS+1<sup>®</sup> Controllers

## MC024-01A



### Mobile Machine Management

Danfoss PLUS+1<sup>®</sup> controllers are elements of the flexible, powerful, expandable, and affordable family of mobile machine management products. These devices are general-purpose controllers that are equally suited for use as a member of a distributed machine control system, with intelligence in every node, or as a stand-alone controller.

### Product Highlights

The MC024-01A employs a Digital Signal Processor (DSP), providing the controller with extremely fast single cycle processing speed and 128K internal flash program memory. This variant of the MC024 features a nominal 10 Vdc power supply for external sensors.

### Application development

The MC024-01A employs an application key that enables the use of Danfoss developed PLUS+1<sup>®</sup> GUIDE machine control solutions.

Users develop MC024-01A applications with PLUS+1<sup>®</sup> GUIDE. This Microsoft Windows based development environment features a user-friendly, field proven, icon-based graphical programming tool, application downloader, and service/diagnostic tool.

### Features

- User-programmable with PLUS+1<sup>®</sup> GUIDE (Graphical User Integrated Development Environment)
- 24 pins: (2) individually keyed DEUTSCH DTM 12 pin connectors
- 32 bit fixed-point DSP running at 150 MHz
  - 12 bit analog-to-digital converter
  - 16 bit timers/counters
- 11 to 36 Vdc power supply, monitored internally
- 1 CAN 2.0 B port, the fixed range analog input can be configured as the shield pin
- Regulated power supply for external sensors rated at up to 10 Vdc (depending on sensor load)
- 2 LEDs under user control
- 3 mounting alternatives: stack, end, or side
- Contains application key required to run Danfoss developed machine control application software
- CE compliant

Comprehensive technical literature online at [powersolutions.danfoss.com](http://powersolutions.danfoss.com)



**Inputs**

14 inputs

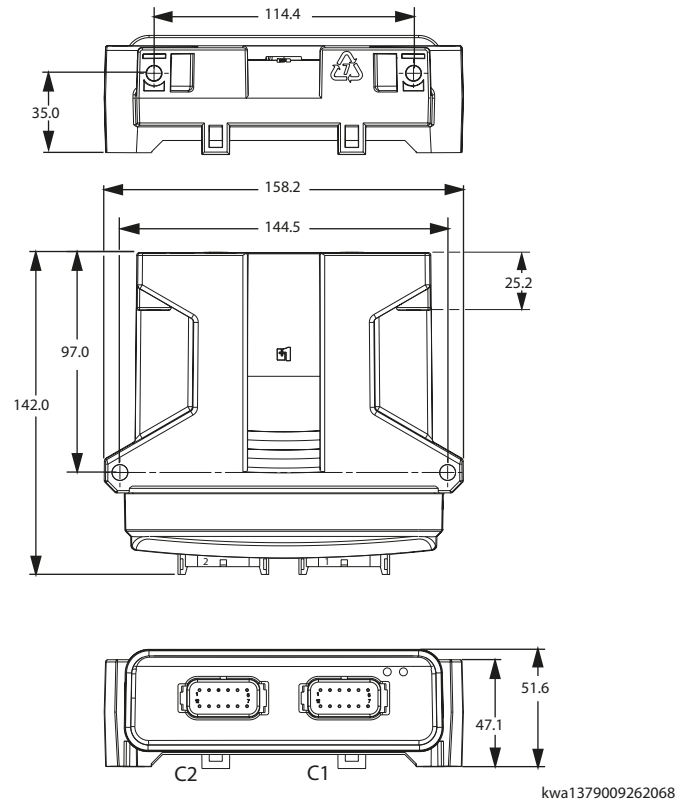
- (5) universal (DIN/AIN/FreqIN) that are user-defined as either:
  - *Analog*: with configurable ranges 0 to 5.25 Vdc (with over range protection) or 0 to 36 Vdc
  - *Digital*: pull up (5 Vdc), pull down (0 Vdc), or pull to center (2.5 Vdc)
  - *Frequency* (timing): 1 Hz to 10 kHz
- (6) digital (DIN) configurable as pull up (5 Vdc), pull down (0 Vdc) or pull to center (2.5 Vdc)
- (2) analog (AIN/Temp/Rheo) 0 to 5.25 Vdc or 0 to 10,000 ohm rheostat
- (1) fixed range analog (AIN/CAN shield) 0 to 5.25 Vdc or CAN shield pin

**Outputs**

4 outputs

- (4) 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

Dimensions in millimeters

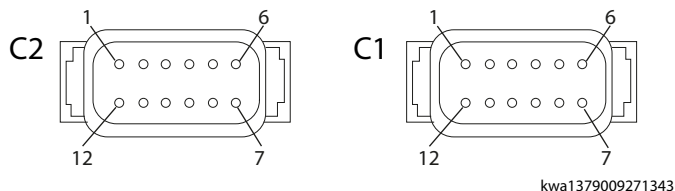


**Caution**

Warranty will be voided if device is opened.  
 Device is not field serviceable. Do not open the device.

Use care when wiring mating connector. Pinouts are for device pins.

12 pin connectors - C2 'B' key (black) and C2 12 C1 'A' key (gray)



kwa1379009271343

12 pin connectors - C1 and C2

Pin	Controller function	Pin	Controller function
C2-P1	DIN	C1-P1	Power ground -
C2-P2	DIN/AIN/FreqIN	C1-P2	Power supply +
C2-P3	DIN/AIN/FreqIN	C1-P3	CAN +
C2-P4	DIN/AIN/FreqIN	C1-P4	CAN -
C2-P5	DIN/AIN/FreqIN	C1-P5	AIN/CAN shield
C2-P6	DIN/AIN/FreqIN	C1-P6	DIN
C2-P7	AIN/Temp/Rheo	C1-P7	DIN
C2-P8	AIN/Temp/Rheo	C1-P8	10 Vdc sensor power +
C2-P9	PWMOUT/ DOUT/PVGOUT	C1-P9	Sensor power ground -
C2-P10	PWMOUT/ DOUT/PVGOUT	C1-P10	DIN
C2-P11	PWMOUT/ DOUT/PVGOUT	C1-P11	DIN
C2-P12	PWMOUT/ DOUT/PVGOUT	C1-P12	DIN



## Product parameters

<b>Supply voltage, minimum</b>	Refer to the following Sensor Power Supply Specification table
<b>Supply voltage, maximum</b>	36 Vdc
<b>Operating temperature (ambient)</b>	-40°C to 70°C [-40°F to 158°F]
<b>Storage temperature</b>	-40°C to 85°C [-40°F to 185°F]
<b>Programming temperature</b>	0°C to 70°C [32°F to 158°F]
<b>IP rating (with mating connector attached)</b>	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

## Sensor Power Supply Specification

Sensor power output (Vdc)	Minimum controller supply voltage (Vdc) for selected sensor loads		
	100 mA sensor load	200 mA sensor load	300 mA sensor load
10	14.2	15.6	15.9
9	12.4	13.5	13.7
8	10.9	11.7	12.1

## Ordering information

### Product part number

<b>MC024-01A</b>	11030728
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### Related products part numbers

<b>CG150 CAN/USB Gateway</b>	11153051	
<b>DEUTSCH mating connector bag assembly</b>	10102023 (16 to 20 AWG)	10100945 (20 to 24 AWG)
<b>PLUS+1<sup>®</sup> GUIDE Professional</b>	11179523	