

# Servo amplifier

## mcDSA-F32

Article number: 1514169

Certification:



Picture similar

### Technical data

| Supply voltages   |                        |
|---|------------------------|
| Electronic supply voltage $U_e^{*2}$                    | 18..30 V               |
| Electronic current consumption @ $U_e=24V^{*3}$         | typ. 65 mA             |
| Power supply voltage $U_p^{*4}$                         | 9..60 V                |
| Output current  |                        |
| Max. output current                                     | 60 A                   |
| Continuous output current (certified UL) <sup>*5</sup>  |                        |
| @ $U_p \leq 24V$  | 17.5 A                 |
| @ $U_p \leq 60V$  | 13.4 A                 |
| Continuous output current (certified CE) <sup>*6</sup>  |                        |
| @ $U_p \leq 24V$  | 18 A                   |
| @ $U_p \leq 60V$  | 14 A                   |
| Continuous output current (not certified) <sup>*7</sup> |                        |
| @ $U_p \leq 24V$  | 19 A                   |
| @ $U_p \leq 48V$  | 15 A                   |
| PWM   |                        |
| PWM frequency   | 32 kHz                 |
| Commutation type  | Field Oriented Control |
| Mechanical  |                        |
| Size LxWxH  | 78 x 74 x 29 mm        |
| Weight  | 95 g                   |
| Environment   |                        |
| Protection class  | IP20                   |
| Installation requirements **                            | IP54                   |
| Ambient temperature (operation) (certified UL)          | -40..50 °C             |
| Ambient temperature (operation) (certified CE)          | -40..55 °C             |
| Ambient temperature (operation) (not certified)         | -40..70 °C             |
| Ambient temperature (storage)                           | -40..85 °C             |
| Rel. humidity (non-condensing)                          | 5..90 %                |
| CAN bus   |                        |
| Protocol  | DS301                  |
| Device profile  | DS402                  |
| Max. baudrate   | 1 Mbit/s               |
| CAN specification                                       | 2.0B                   |
| Galvanically isolated                                   | no                     |
| RS485   |                        |
| Type  | 2-Wire EIA-485         |
| Signals   | DATA,/DATA,CLK,/CLK    |
| Functional safety                                       |                        |
| Safety function refer safety manual                     | Safe Torque Off (STO)  |
| Safety Integrity Level (SIL)                            | up to SIL 3            |
| Performance Level (PL)                                  | up to PL e             |

\*1 The certified performance data must be observed (see UL Instruction Note and Safety Manual (CE))

\*2 No reverse polarity protection, the destruction limit is at overvoltage of  $\geq 33V$  or short-term peak voltage of  $37V < 1s$

\*3 power amplifier switched off, 5V output (sensor supply) is free, STO active

\*4 No reverse polarity protection, the destruction limit is at overvoltage of  $\geq 70V$

\*5 connector cable with max. possible cable cross-section, PWM frequency 32 kHz (SVPWM), ambient temperature 50 °C, I/O's and 5V output active, RMS current: 17.5 A  $\rightarrow$  12.5 Aeff, 13.4 A  $\rightarrow$  9.5 Aeff

\*6 connector cable with max. possible cable cross-section, PWM frequency 32 kHz (SVPWM), ambient temperature 40 °C, I/O's and 5V output active, RMS current: 18 A  $\rightarrow$  12.7 Aeff, 14 A  $\rightarrow$  10 Aeff

\*7 connector cable with max. possible cable cross-section, PWM frequency 32 kHz (SVPWM), ambient temperature 40 °C, I/O's and 5V output free, RMS current: 19 A  $\rightarrow$  13.4 Aeff, 15 A  $\rightarrow$  10.6 Aeff

no guarantee, since value is determined empirical, please consider the application notes to determine the continuous current

\*8 or equivalent protection class (see Safety Manual (CE))

Additional technical data are available in mcManual.



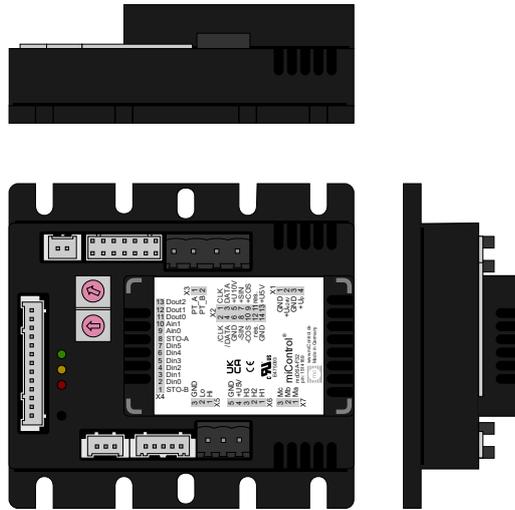
miControl® GmbH

Chausseestraße 34

14979 Großbeeren (bei Berlin)

| Sensor supply (Hall)                        |                                   |
|---|-----------------------------------|
| Output voltage                              | 5 V                               |
| Max. output current                         | 0.05 A                            |
| Sensor supply (Encoder/SSI)                 |                                   |
| Output voltage                              | 5 V                               |
| Max. output current                         | 0.2 A                             |
| Sensor supply (Hiperface)                   |                                   |
| Output voltage                              | 10 V                              |
| Max. output current                         | 0.25 A                            |
| Encoder                                     |                                   |
| Type  | sin / cos                         |
| Signals                                     | +Sin,-Sin,+Cos,-Cos               |
| Resolution                                  | 13 bit per sine period            |
| Input voltage                               | 1 V peak-peak, differential       |
| Signal type                                 | sine/cosine, analog, differential |
| Hall sensors                                |                                   |
| Signals                                     | H1,H2,H3                          |
| Max. frequency (per channel)                | 10 kHz                            |
| Input voltage                               | 0.5 V                             |
| Signal type                                 | open collector, single ended      |
| Digital inputs                              |                                   |
| Number - digital inputs                     | 6 (Din0..5)                       |
| Low voltage                                 | 0.5 V                             |
| High voltage                                | 8..30 V                           |
| STO channels (ST0-A..B)                     |                                   |
| Low voltage                                 | 0.5 V                             |
| High voltage                                | 8..30 V                           |
| Digital outputs                             |                                   |
| Number                                      | 3 (Dout0..2)                      |
| Continuous output current (certified UL/CE) | 1 A                               |
| Continuous output current (not certified)   | 1.5 A                             |
| Load Dout0..1                               | resistive, low inductive          |
| Load Dout2                                  | resistive, inductive              |
| Output voltage                              | Electronic supply voltage $U_e$   |
| Signal type                                 | positive switching                |
| Analog inputs                               |                                   |
| Number                                      | 2 (Ain0..1)                       |
| Signal type - Ain                           | 0..10 V, 12 Bit, single ended     |

## Scheme



©2025 by miControl

## Terminal assignment

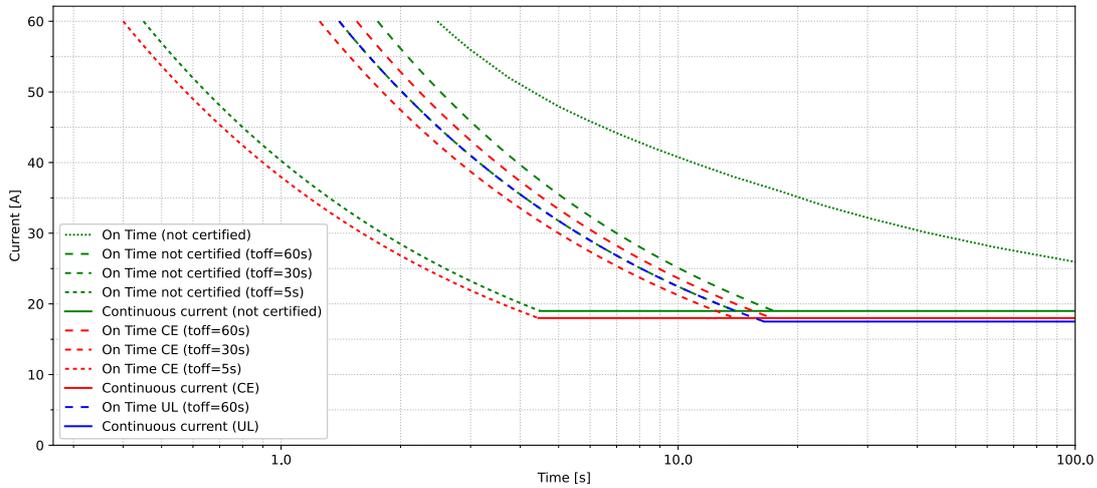
| X1 Supply  |        |   |
|------------|--------|---|
| 1          | GND    | Ground for electronic supply voltage                              |
| 2          | +Ue24V | Electronic supply voltage   |
| 3          | GND    | Ground for power supply voltage                                   |
| 4          | +Up    | Power supply voltage  |
| X2 Encoder |        |   |
| 1          | CLK    | SSI clk   |
| 2          | /CLK   | /SSI clk  |
| 3          | DATA   | SSI data  |
| 4          | /DATA  | /SSI data   |
| 5          | +U10V  | 10V output voltage for sensor supply<br>Sensors: Hiperface        |
| 6          | GND    | Ground for sensor supply<br>Notice: don't connect with system GND |
| 7          | +SIN   | Encoder, plus sine signal   |
| 8          | -SIN   | Encoder, minus sine signal  |
| 9          | +COS   | Encoder, plus cosine signal                                       |
| 10         | -COS   | Encoder, minus cosine signal                                      |
| 11         | res.   | Reserved  |
| 12         | res.   | Reserved  |
| 13         | +U5V   | 5V output voltage for sensor supply<br>Sensors: encoder, SSI      |
| 14         | GND    | Ground for sensor supply<br>Notice: don't connect with system GND |
| X3 PT1000  |        |   |
| 1          | PT_A   | PT_A  |
| 2          | PT_B   | PT_B  |
| X4 I/O's   |        |   |
| 1          | STO-B  | STO channel B   |
| 2          | Din0   | Digital input 0   |
| 3          | Din1   | Digital input 1   |
| 4          | Din2   | Digital input 2   |
| 5          | Din3   | Digital input 3   |
| 6          | Din4   | Digital input 4   |
| 7          | Din5   | Digital input 5   |
| 8          | STO-A  | STO channel A   |
| 9          | Ain0   | Analog input 0  |
| 10         | Ain1   | Analog input 1  |
| 11         | Dout0  | Digital output 0  |
| 12         | Dout1  | Digital output 1  |
| 13         | Dout2  | Digital output 2  |

| X5 CAN bus      |         |   |
|-----------------|---------|---|
| 1               | CAN Hi  | CAN High  |
| 2               | CAN Lo  | CAN Low   |
| 3               | CAN GND | CAN Ground  |
| X6 Hall encoder |         |   |
| 1               | H1      | Hall sensor 1   |
| 2               | H2      | Hall sensor 2   |
| 3               | H3      | Hall sensor 3   |
| 4               | +U5V    | 5V output voltage for sensor supply<br>Sensors: hall              |
| 5               | GND     | Ground for sensor supply<br>Notice: don't connect with system GND |
| X7 Motor        |         |   |
| 1               | Ma      | Motor phase A   |
| 2               | Mb      | Motor phase B   |
| 3               | Mc      | Motor phase C   |

Diagrams

miControl®

mcDSA-F32 Rev.A1

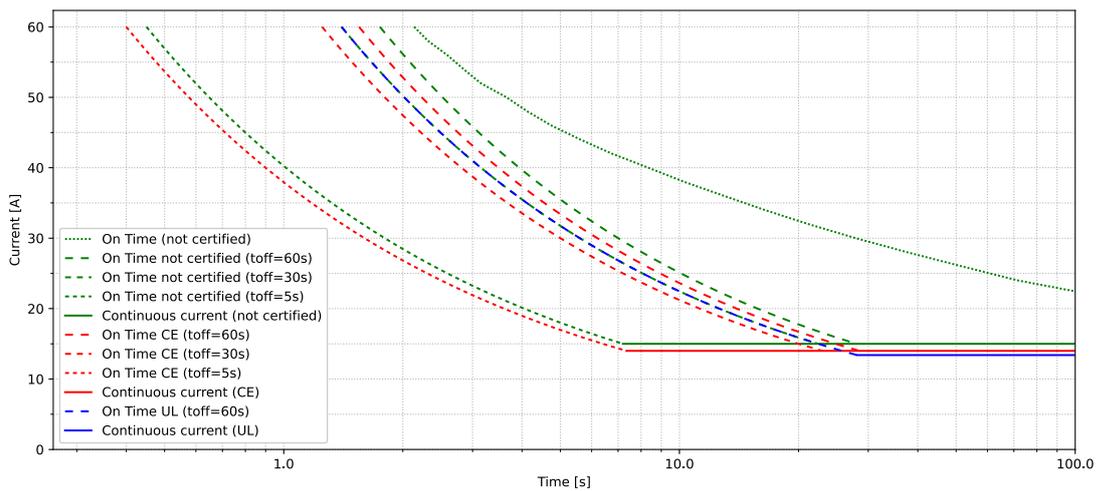


ambient temperature 40°C  
 power supply voltage Up 24V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 19A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03

miControl®

mcDSA-F32 Rev.A1



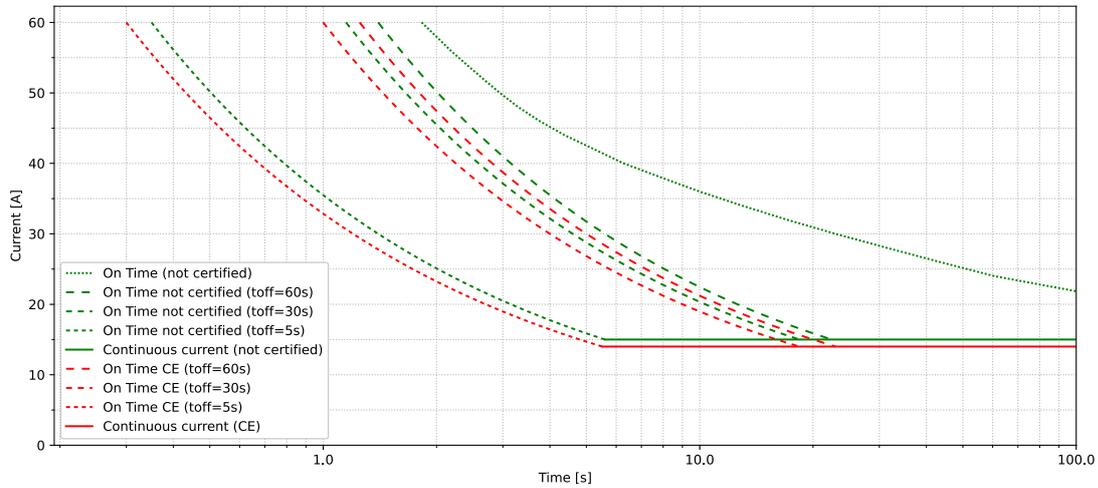
ambient temperature 40°C  
 power supply voltage Up 60V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 15A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03

Diagrams

miControl®

mcDSA-F32 Rev.A1

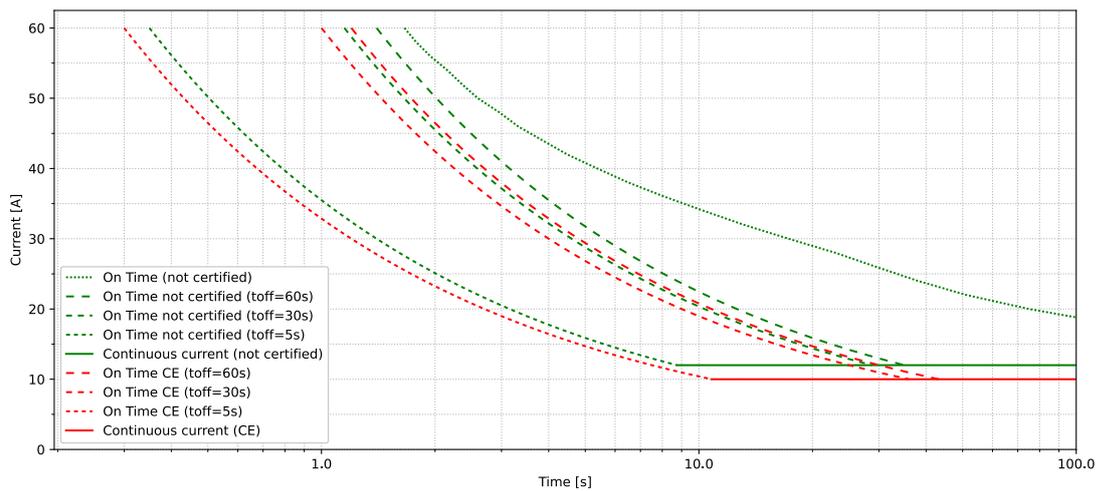


ambient temperature 55°C  
 power supply voltage Up 24V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 15A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03

miControl®

mcDSA-F32 Rev.A1



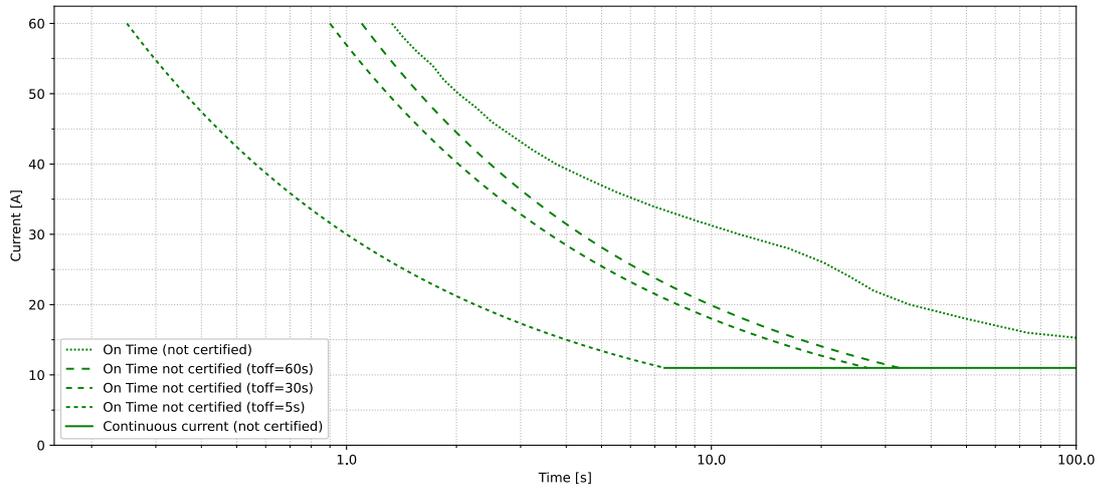
ambient temperature 55°C  
 power supply voltage Up 60V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 12A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03

Diagrams

miControl®

mcDSA-F32 Rev.A1

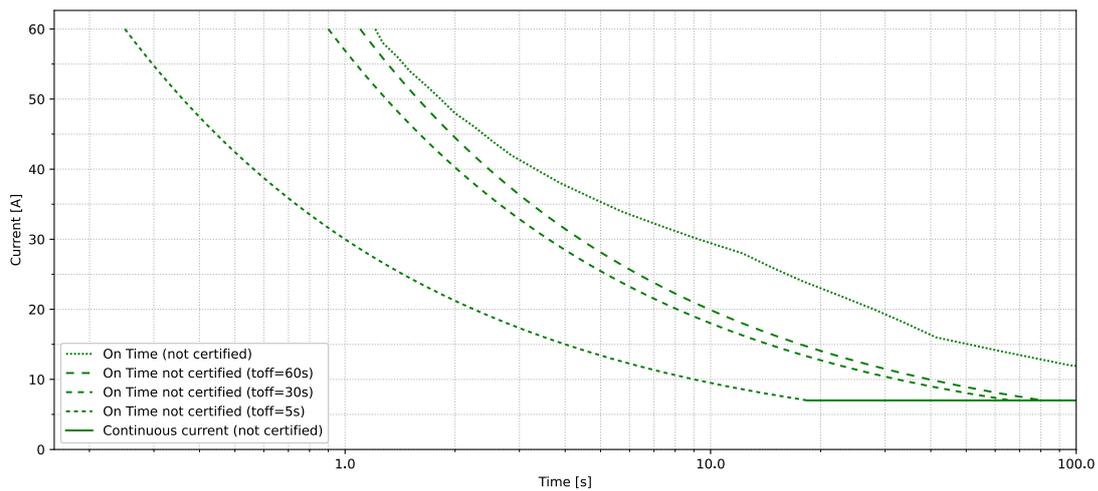


ambient temperature 70°C  
 power supply voltage Up 24V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 11A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03

miControl®

mcDSA-F32 Rev.A1



ambient temperature 70°C  
 power supply voltage Up 60V  
 PWM frequency 32kHz  
 PWM mode asymmetric  
 inductance per motor phase 150µH  
 continuous current 7A

Copyright 2023© by miControl® - Modifications and errors excepted - 1.00.00.03