

Commissioning manual for

device series DR312, DR322

Hardwareversion DR300_02

Softwareversion DR300_02

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Introduction

The device series DR312, respectively DR322 can be used with brushed or brushless DC motors in a variety of applications.

When operating as a speed controller or speed governor the 0 – 10V, or +/- 10V analogue input can be used.

When the unit is used as one or two axis position controller, various interfaces are available.

The unit also can be used as a synchronisation controller in different modes.

The two axis controller hardware can control one master and one slave motor, or only one motor with an external master using an encoder as the target speed.

The integrated LCD display visualizes different conditions and is used for parameter setting.

With the integrated USB interface, software updates, can be made easily.

1.1 Safety

This operating guide contains instructions for ensuring safe and proper installation and operation. If you have any difficulties which cannot be resolved by consulting this guide, please check with the machine manufacturer or vendor for additional information.

Hejm GmbH is not liable for any personal injury or equipment damage resulting from improper commissioning, incorrect operation, misunderstandings or errors contained in this guide or on the display.

Hejm GmbH reserves the right to make technical changes to the equipment or operating guide without prior notice. This means that errors in agreement between the equipment and the guide cannot be precluded.

Pay particular attention to hazard notices in this operating guide.

This equipment description should be carefully read in full before commissioning.

Use of the operating guide presumes that the user is technically qualified.

1.2 Personnel Qualifications

commissioning, installation and operation are to be performed only by qualified personnel. The personnel must have qualifications which are appropriate to their function and activity, e.g.

- Instruction and obligation to observe all application-related, regional and in-house regulations and requirements.
- Training in accordance with the standards of safety technology in the use and care of commensurate safety and work protection equipment.
- Courses in first aid, etc.

1.3 Proper use

DR321, DR322 controllers have been developed solely for use on industrial machinery.

Any further use is considered improper. The manufacturer assumes no liability for damages resulting from such misuse. This risk is assumed solely by the user.

1.4 Safety Notes

The following symbols are used for hazards and other important notes:



The **Hazard** symbol warns of errors and hazards in commissioning and operation of the controller. This warning notice means a directly threatening hazard to the health of persons and contains special specifications and instructions as well as imperatives and prohibitions for preventing personal injury and damage to equipment.



The **Attention** symbol means a possible hazardous situation and contains special specifications and instructions as well as imperatives and prohibitions for preventing personal injury and damage to equipment.



The **Note** symbol indicates important and useful information and provides application tips.

1.5 Safety Precautions

Though the device can be operated with 24V or 48V supply voltage, be especially careful not to touch the unit and to secure the device in accordance with the relevant regulations.

The device may not be opened and no screws removed from the housing!

1.6 Warranty and Delivery Terms

We deliver exclusively under the general conditions for the supply of products and services of the electrical and electronics industry.

Hejm GmbH, warrants this product for a period of twenty-four (24) months from the date of shipment.

2. Technical data

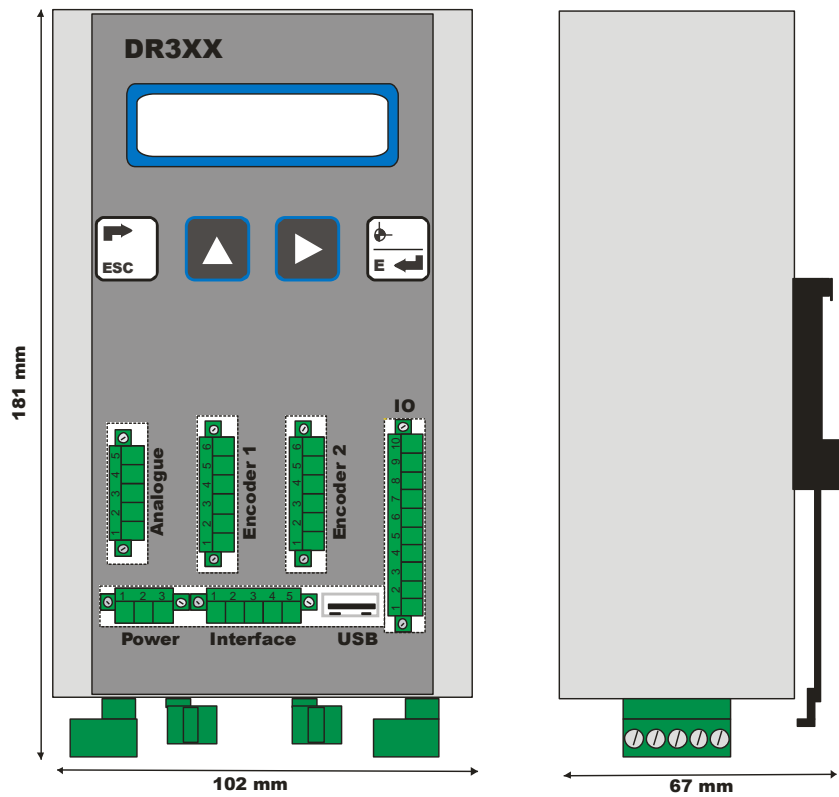


Abb. 1 DR322 Dimensions (illustration reduced)

Supply voltage	24V DC for controller $\pm 10 \%$, and. 24 V – 48V DC $\pm 10 \%$ for drive
Current consumption	Max. 100 mA without periphery
Display	LCD display with 2 x 16 characters
Input signals	0 – 5 V activ low 10 - 30 V activ high
Measuring system	Optional incremental measuring Supply voltage 24V Max. Input frequency: 50 kHz for speed control Min. edge separation 20 us
Drive source current	4Q CMOS drive DC model: Max. continous current 8A per axis using both axis parallel Max. continous current 12A when driving only one axis Optional one axis can source 10A for a time period of max. 10 minutes.. Short cicuit control at 27 A.
Respons time	< 500 us
Analogue Input - Motoransteuerung	2 x +/- 10V, or 0 – 10V input, 11 bit. 2 x 0 – 20mA, or 4 – 20mA inputs for optional application.
Interfaces	USB interface for software updates RS232, optional RS485, Can interface
Operating temperature	0 – 50 °C

Storage temperaure	-20 - + 65 °C
Relative humidity	max. 90 % (non condensing)
Installation orientation	Vertikal on din rail
Enclosure rating	IP00
Dimensions	181 x 102 x 67 mm ³ (W x H x D)

3. Commissioning



Most damage to the device is a result of faulty cabling and incorrect parameter values. Therefore commissioning is to be performed only by trained and expert personnel.

3.1 Installation



The .device is mounted on a din rail.

3.2 Connection



Before connecting, compare the part label on the side of the device.



Electrical cables are to be routed in accordance with the respective national regulations (e.g. VDE). Route measuring, signal and power cables separately.

We recommend using only shielded cable connected to GND on the device.

Ensure that no ground loops are created.

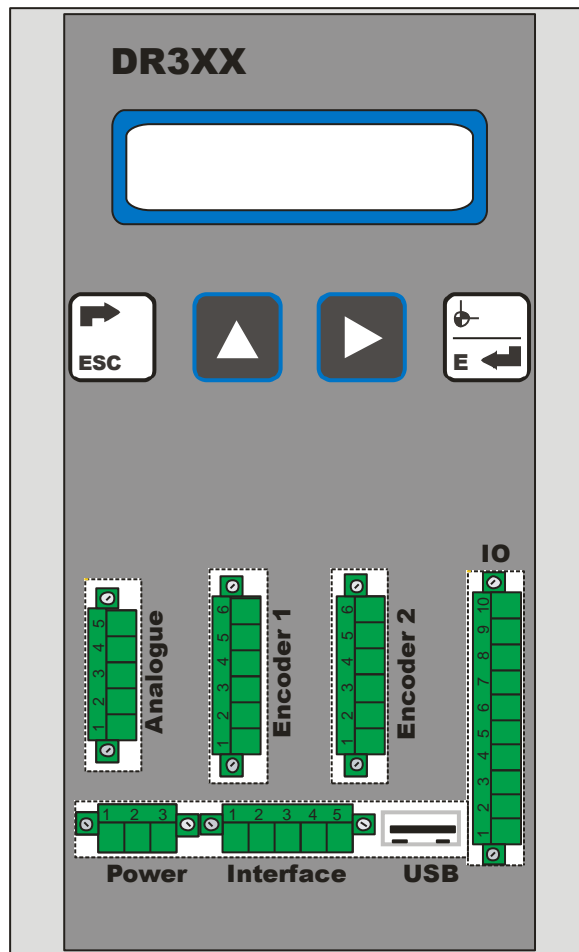


Abb. 2 Connection located on the front panel

CON1 Power supply for electronic 24V DC (Power)

Terminal strip 3 pin

- Pin 1 GND, 0V
- Pin 2 +24V DC, +/- 10%
- Pin 3 NC, not connected

CON2 Analogue inputs (Analogue)

Terminal strip 5 pin

Pin 1	GND
Pin 2	0 – 10V, or +/- 10V input for target speed motor 1
Pin 3	0 – 10V, or +/- 10V input for target speed motor 2
Pin 4	0 – 20mA, or 4 – 20mA input for optional application
Pin 5	0 – 20mA, or 4 – 20mA input for optional application

CON3 Measuring system motor 1 (Encoder 1)

Terminal strip 6 pin

Pin1	GND for measuring system supply
Pin 2	+24V for measuring system supply max. 120 mA.
Pin 3	Signal A
Pin 4	Signal B
Pin 5	Signal Z
Pin 6	GND, for shield

When brushless DC motors are connected, the rotor position signals can be used as a measuring system too.

In this case Con 3 will not be used.

CON4 Measuring system motor 2 (Encoder 2)

Terminal strip 6 pin

Pin1 GND for measuring system supply

Pin 2 +24V for measuring system supply
max. 120 mA.

Pin 3 Signal A

Pin 4 Signal B

Pin 5 Signal Z

Pin 6 GND, for shield

When brushless DC motors are connected, the rotor position signals can be used as a measuring system too.

In this case Con 4 will not be used.

CON5 Digital inputs, outputs (IO)

Terminal strip 10 pin

According to the application the IO's differ.

Please refer to the respective commissioning instructions

CON6 Interface(Interface)

Terminal strip 5 pin

Pin 1 Can L

Pin 2 RS232 RxD

Pin 3 RS232 TxD

Pin 4 Can H

Pin 5 GND

CON7 USB update connector (USB)

USB connector

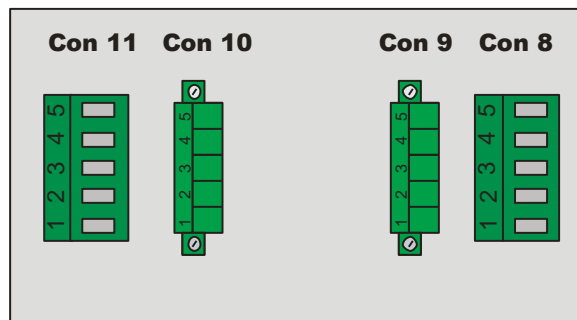


Abb. 3 Wiring diagram bottom plate

CON8 Motor connector for DC motor 1

Terminal strip 5 pin

(Master motor in synchron mode)

Pin1 GND, input for motor supply

Pin 2 +24V - + 48V DC input for motor supply

Pin 3 Motor phase T

Pin 4 Motor phase S

Pin 5 Motor phase R,
not connected when brushed motors are used

CON9 Rotor position encoder for DC motor 1

Terminal strip 5 pin

Pin1 GND, for rotor position encoder supply

Pin 2 +12V for rotor position encoder supply ,(5V supply
possible via internal jumper)

Pin 3 Hall sensor C (Motor phase T)
Connect this to GND when brushed motors are used.

Pin 4 Hall sensor B (Motor phase S)

Pin 5 Hall sensor A (Motor phase R)

CON10 Motor connector for DC motor 2

Terminal strip 5 pin

(Slave motor in synchron mode)

Pin1 GND, input for motor supply

Pin 2 +24V - + 48V DC input for motor supply

Pin 3 Motor phase T

Pin 4 Motor phase S

Pin 5 Motor phase R,
not connected when brushed motors are used

CON11 Rotor position encoder for DC motor 2

Terminal strip 5 pin

Pin1 GND, for rotor position encoder supply

Pin 2 +12V for rotor position encoder supply ,(5V supply
possible via internal jumper)

Pin 3 Hall sensor C (Motor phase T)
Connect this to GND when brushed motors are used.

Pin 4 Hall sensor B (Motor phase S)

Pin 5 Hall sensor A (Motor phase R)

4. Error messages

The following error messages may appear on the display..

Error Axis 1 E-Stop active


When the power supply of the drive is disconnected, the device will show the message above, because the emergency stop should disconnect the motor supply for safety reasons.

When the supply is disconnected while a motor is running, this message will appear immediately. Otherwise it can last some seconds, because the capacitors in the DC link must be unloaded first.

This message relates to both axis.

Error axis 1 Drive Temp.!

The maximum temperature set in parameter P97 in parameter level All is exceeded.


This message can be reseted by pressing , when the temperature falls below this value minus a hysteresis.

This message relates to both axis.

The following messages relate to the axis shown on the screen.

Error axis x Overcurrent Err.


The motor current exceeded the current, set in P07 of the axis parameter for a defined time.

This message can be reseted by pressing , or by activating the external reset input.

Error Axis x Measuring system

The device didn't get pulses from the measuring system over a time period set in the axis parameter.

This message will not appear, when using the device as a speed controller or a speed governor.

This message can be reseted by pressing , or by activating the external reset input.

Error axis x Short circuit!

The current consumption of an axis has exceeded 27A.

This message can only be reseted by switching off the device.

5. Software update

5.1 Software update procedure

Via the USB interface software updates can easily be transmitted to the device.

For this purpose the update software „DR300v1.bin“ for example, must be loaded on a USB stick and connected to the USB connector of the device afterwards.

The device automatically is searching for data files named .bin and shows the filename on the display.


Since the display can only show one filename on the screen, only the first file found is shown.

Therefore only one file named „.bin“ should be stored on the USB stick.

The following message is displayed.



USB connect
Dr300 v 1.bin

When  is pressed the download is started.


If any other key is pressed the download is terminated.



Load file
Dr300 v 1.bin

When the software download is finished, the LED backlight is switched off and after the boot sequence was successful, switched on again.

When the USB stick is still connected to the device the following message will be displayed again.



USB connect
Dr300 v 1.bin

The USB stick can now be removed.

5.2 Restore the previous version

In case a wrong update was programmed to the device the previous software version can be restored.

In this unlikely case please contact hejm-GmbH to send you a manual, how to restore the previous software version.

6. Interfaces

The device has several optional interfaces.

The regarding interface descriptions are available in separate documents.

6.1 Abbildungsverzeichnis

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