DRE

ELECTRONIC FAN SPEED CONTROLLER, DIN RAIL MOUNTING

Mounting and operating instructions

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SAFETY AND PRECAUTIONS

Read all the information in this manual, in the datasheet and in the Modbus Register Map before working with the product. For personal and equipment safety and for optimum product performance, make sure you fully understand the content before installing, using or servicing this product.

For safety and licensing (CE) reasons, unauthorised conversions and / or modifications of the product are inadmissible.

The product should not be exposed to abnormal conditions, such as extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible and avoid condensation.

All installations must comply with local health and safety regulations and local electrical standards and approved codes. This product should only be installed by an engineer or a technician with expert knowledge of the product and safety precautions.

Avoid contact with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always check that you are connecting the correct power supply to the product and use wires of the correct characteristics and cross-section. Make sure all screws and nuts are properly tightened and fuses (if any) are in place.

Consideration should be given to recycling the equipment and packaging. These should be disposed of in accordance with local and national laws and regulations.

If there are questions that are not answered, contact your technical support or consult a professional.

PRODUCT DESCRIPTION

DRE is a digital motor speed controller with a regulated and an unregulated output, a minimum and maximum output voltage setting and a kickstart / softstart selection. It features an output overwrite function in Modbus mode.

ARTICLE CODES

Code	Supply	Max. rated current, [A]
DRE-1-25-DT	230 VAC ±10 % / 50—60 Hz	2,5

INTENDED AREA OF USE

- Stepwise speed control of voltage controllable motors in ventilation systems
- For indoor use only

TECHNICAL DATA

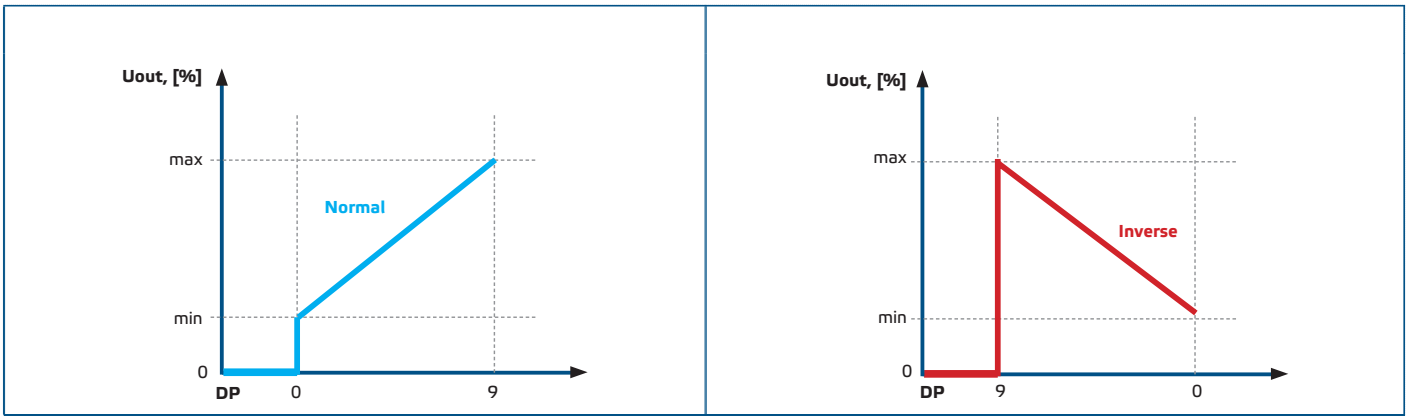
- 7-segment LED display and 3-button keyboard interface
- Power supply: 230 VAC ± 10 % / 50—60 Hz
- Unregulated output: 230 VAC / max. 0,5 A
- Regulated output to motor / fan: 30—100 % Us*
- Max. load: 2,5 A
- Minimum speed: 30—65 % Us* (approx. 70—150 VAC)
- Maximum speed: 75—100 % Us* (approx. 170—230 VAC)
- Regulation: Normal or Inverse
- Enclosure:
  - DIN rail mounting (EN 60715: 2003)
  - ABS, grey (RAL 7035)
  - protection standard: IP30 (according to EN 60529)
- Operating conditions:
  - temperature: 0—35 ºC
  - rel. humidity: 0—80 % rH (non-condensing)
- Storage temperature range: -40—70 ºC

STANDARDS

CE

- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC:
  - EN 61000-6-3:2007/A1:2011/AC:2012 Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
- DIN rail EN 60715:2003

OPERATIONAL DIAGRAMS



WIRING AND CONNECTIONS

L, N	Supply voltage, 230 VAC ±10 % / 50—60 Hz
U2, U1	Regulated output (30—100 % Us)
L1, N	Unregulated output 230 VAC / 0,5 A
A	Modbus RTU (RS485) signal A
/B	Modbus RTU (RS485) signal /B
Connections	Cable cross section: max. 2,5 mm^2

MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the **DRE** speed controller, read carefully "**Safety and Precautions**". Then proceed with the following steps:

1. Mount the controller on a standard DIN rail. Pull the locking clip before you place the unit onto the rail and then push the locking clip back to its original position to fix the enclosure to the rail (see **Fig. 1**, **Fig. 2** and **Fig. 3** below).

Fig. 1 DIN rail locking clip

Fig. 2 Mounting dimensions

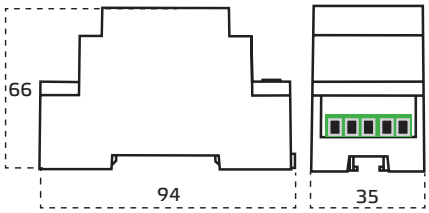
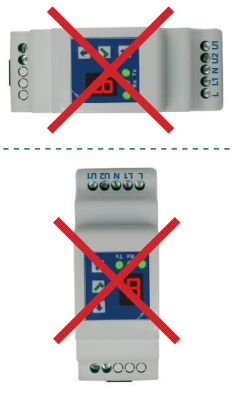


Fig. 3 Mounting position

Correct

Incorrect



2. Do the wiring according to the wiring diagram (**Fig. 4**) using the information from the section "**Wiring and connections**".
3. Switch on the power supply.

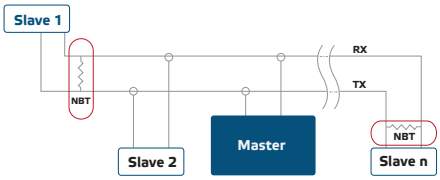
Fig. 4 Wiring diagram and settings

⚠ ATTENTION

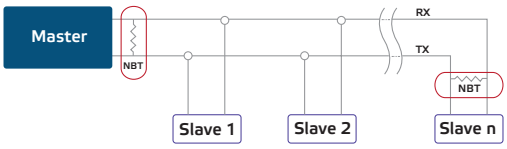
If an AC power supply is used with any of the units in a Modbus network, the GND terminal should NOT BE CONNECTED to other units on the network or via the CNVT-USB-RS485 converter. This may cause permanent damage to the communication semiconductors and / or the computer.

4. Check if your unit starts or terminates the network (see **Example 1** and **Example 2**). If it does, connect the NBT resistor via Modbus. Otherwise, leave it disconnected (default Modbus setting).

Example 1



Example 2



5. Customise the settings (Umin, Umax, regulation type, start type, kickstart duration and unit status) to the desired ones. Use either the menu or Modbus. For more details, please refer to the **"Operating instructions"** chapter.

OPERATING INSTRUCTIONS

The **DRE** controller provides a normal / inverse regulation of the output signal (a percentage of the supply voltage) — see section "**Operational diagrams"**.
When the regulation is normal, the output voltage increases proportionally with the steps.
DP (decimal point) is the "OFF" state, step '0' is the selected minimum output voltage and step '9' is the selected maximum output voltage.
When the regulation is inverse – the output voltage decreases proportionally with steps.
DP (decimal point) is the "OFF" state, step '9' is the selected maximum output voltage and step '0' is the selected minimum output voltage.

NOTE

Both diagrams refer to an ideal case of a resistive load. When using inductive loads, the output voltage might be lower. Adjust the steps to set the required voltage.

All control parameters and their default values are shown in the table below. You can customise them through Modbus (see table ***Modbus register maps***) or most of them – via the 3-button interface and the menu — see **Fig. 4d** and table ***Adjustable parameters***.

Adjustable parameters				
Parameter	**Minimum**	**Maximum**	**Default value**	**Menu**
Umin	30 % Us* (70 VAC)	65 % Us* (150 VAC)	30 % Us*	U
Umax	75 % Us* (170 VAC)	100 % Us* (230 VAC)	100 % Us*	u
Regulation type	-	-	Normal	r
Start-up type	-	-	Kickstart	A
Kickstart time	3	9	5 s	t
NBT resistor			Disconnected	n
Unit status	-	-	Off	-
Output overwrite value	0 % Us* (0 VAC) / 30 % Us* (70 VAC)	100 % Us* (230 VAC)	0 % Us* (0 VAC)	-
L1 output relay **	-		On	-
Baud rate	0	6	2 (19.200 bps)	-
Parity	0	2	1 (8E1)	-

* Us - the mains supply voltage (230 VAC ± 10 %)
** Accessible only in Modbus mode with output overwrite enabled (holding registers 7 and 8 are set to '1'.)

- Press up ⬆ and down ⬇ buttons at the same time for 3 seconds to switch the controller on / off.
- If there is no action within 10 seconds, you exit the menu and the parameter change is disregarded.
- Use up ⬆ and down ⬇ buttons to navigate through the menu.
- Use up button ⬆ to select the next item or increase values.
- Use down button ⬇ to select the previous item or decrease values.
- Use OK button ✔ to access the menu or to confirm a selection.

DISPLAY AND LIGHT INDICATIONS

The 7-segment display shows all menu items and settings, and the output step as well.
The decimal point ('.') shows that the unit is off.
The small letter 'd' indicates that the unit is in Modbus mode. The rest of the letters on the display indicate a settable parameter. See table ***Adjustable parameters***.
A digit on the display indicates either the current output step or a parameter setting. See table ***7-segment display indication***.

7-segment display indications

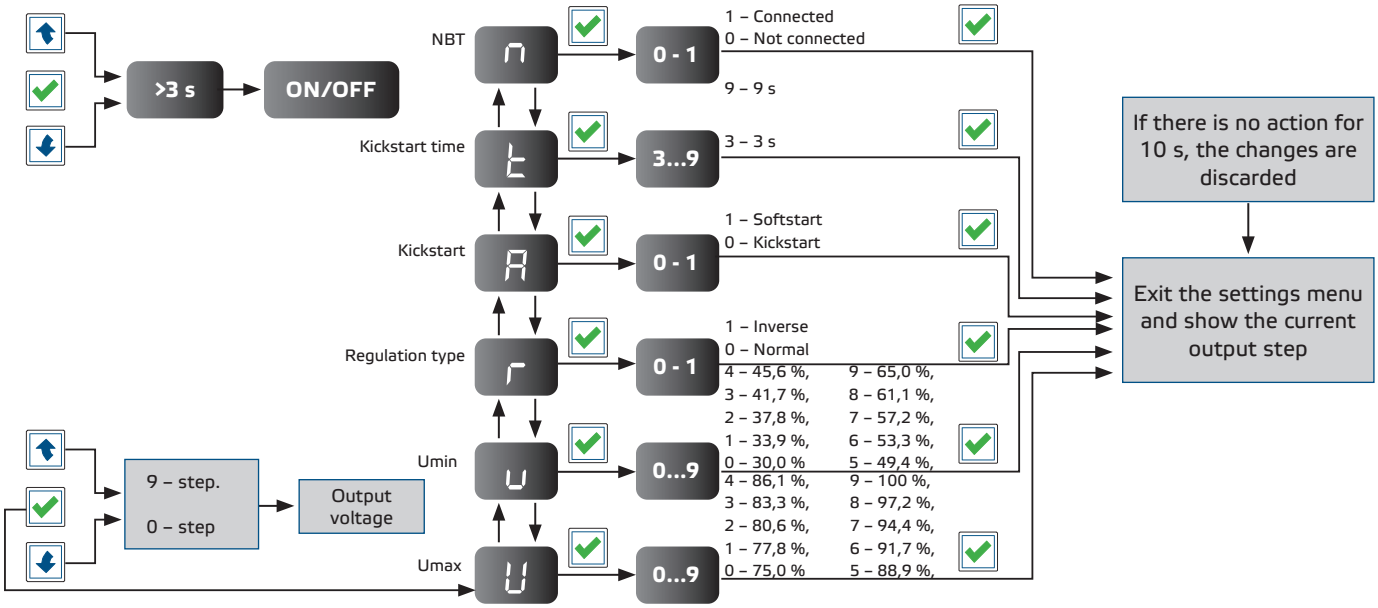
Indication		Description
	7-segment display indication: a digit or a letter (**'n', 't', 'A', 'r', 'u', 'U'**)	- Current output step (0—9) - Parameter (as indicated in the table ***Adjustable parameters***)
	Indication: decimal point	The DRE controller is off
	Indication: small 'd'	Modbus mode

There are three green LED indicators on the front cover of the unit. The "On" LED indicates power on. It is always on when the controller is supplied — see **Fig. 4b**.

The"Rx" LED indicates Modbus RTU receiving data. It blinks when the controller receives packages via Modbus — see **Fig. 4c**.

The"Tx" green LED indicates Modbus RTU transmitting data. It blinks when the controller transmits packages via Modbus — see **Fig. 4c.**

MENU STRUCTURE



TROUBLESHOOTING

When you switch on the power supply, the green LED operating indicator shown in **Fig. 4b** will give out constant green light. A decimal point will appear on the 7-segment LED display showing that the unit is in OFF state. If this is not the case, check the connections.

Check if both LEDs on the front cover (Tx and Rx) blink after you switch on the unit — see **Fig. 4c**. If they do, the unit has detected a Modbus network. If they do not, check the connections again.

TRANSPORT AND STOCK KEEPING INFORMATION

Avoid shocks and extreme conditions; stock in original packing.

WARRANTY AND RESTRICTIONS

The warranty is valid for two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the date of publication relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or dampish cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.