

# PAUL-GOTHE-GmbH Bochum

Wittener Straße 82  
D-44789 Bochum

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## Manual

for

### Temperature controller (36.021 and 36.021-DUO)

Before use check the electrical condition of the appliance. For your safety: Don't connect with the power supply if you can see any damage.

The temperature controller can be used in conjunction with the permissible temperature sensors according to specification for controlling of heating elements / cartridges.

More information and the Declaration of Conformity can be found at service and support on: [www.paulgothe.de](http://www.paulgothe.de)

### How to use:

- 1 Connect the temperature couple to the NiCr-Ni port.
- 2 Connect the power supply from the heating cartridges / heating elements at the electric socket.
- 3 Connect the power supply from the controller and meet all necessary protective measures according to local regulations.
- 4 Set the desired temperature.
- 5 Heating modes are indicated by LED.
- 6 Device is provided with a breakage protection element. Should the temperature couple fails, no output voltage is enabled.

### Technical Data

Housing:	Material: Makrolon ® (thermoplast. polycarbonate plastic)
Operating conditions:	-10 ... +50°C
Supply voltage:	max. 230 V, 48 ... 62 Hz
Operating range:	depending on the temperature sensor NiCr-Ni: 20 ... 600 ° C
Output voltage:	2 x max. 250 V, max. 5 A, circuit via contactor for heating

#### If at the power exit is no 220V ("not heating"):

Please disconnect controller from power and open the cover:

1. Please check the fuse at the main switch and the fuse inside the unit (DUO: fuses) and replace them if necessary (5 A slow-blow, only the DUO-Version: fuse at the main switch: 10 A).
2. If fuse is OK, please replace relay (replacement relay is glued). Instructions for replacing the relay can be found on our website under Service and Support.

#### If the controller continuously supplies 220V ("don't regulate but constant power"):

1. Exchange the relay (replacement relay is glued). Instructions for replacing the relay can be found on our website under Service and Support.

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## Short Operating Instruction for temperature regulator 400

We deliver our temperature regulator in its basic adjustment for the control of heaters. For other applications, the parameters should be accordingly modified with the help of the attached operating instruction.

1. Link: There is a link for the thermocouple (NiCr Ni, type K) on the front plate. Laterally, heaters can be steered through the automatic controller. The permissible power for each power connection amounts to 5 A with 230 ~V. Attention the output is only for resistive load!
2. Display: The temperature (actual value) measured at the thermocouple is displayed. Heater switching impulses (220 V at the plug sockets) are displayed by a red LED down/up OUT 2. If the actual value is below the set point, this is displayed by a red LED arrow directing to the left (LOW); if the actual value exceeds the set point, this is indicated by a red LED arrow directing right (HIGH) OUT 2 turn off; no 220 V at the plug sockets). If the actual value is within the range of tolerance of the set point, a green beam-LED lights up.
3. Temperature adjustment: Through pressing key >F< on the front plate „-SP“ appears, alternating with the set point actually given. With the arrow keys > v / ^ < the desired set point can be set. After the modification press key >F< again to transfer the new set point (display: > AL.1<). After 5 seconds the instrument switches back into the initial state and the modified set point is taken over. If the desired value is modified and there is no acknowledgement by key >F< after 5 seconds, the instrument again switches back into the initial state, but the set point is reduced to the lower alarm value. By pressing key >F< second time (next of the set point), further values such as alarm value 1 and 2 (optionally) and the placing degrees (not by automatic, only by manual) can be called up. Note: if key >F< is initially pressed longer than 2 seconds, you achieve a level on which there is the danger of an unintentional change of the functional parameters.
4. Temperature control: Thermocouple NiCr Ni type K, without self-optimization and auto optimization, proportional temperature control, with soft start function (note: heating regulates the full heating power after approximately 3-5 minutes; in any case soft start for the protection of the heating cartridge).

### Important adjustments for modifications of the temperature control:

Blocked: Pass: 99 (protection: 28)

by parameter CFG (press >F< key for 2 seconds, press twice afterwards, CFG appears)

S.tu: Adjustment whether working with optimization (see instruction)

h.Pb: Value of heating in proportion to the final value of the thermocouple; i.e. the regulation starts 1 % of the thermocouple's final value below the set point. Example: adjustment: 1,0, thermocouple type K: 1300°C = 1 % = 13 °C, set point: 500 °C; this means that the temperature control is started at 487°C.

h.It: the smaller the value, the more an adaptation value to the set point is attempted. If the value is small, there is the danger of over swing.

h.dt: the larger the value, the more an over swing is prevented; this affects a dampening of the controlling action. The relation of the values h.It to h.dt should always be 4:1.

5. Manual regulation: Through pressing key > O < you can choose between automatic and manual operation. In case of manual operation the instrument is only used as a momentum generator and there is no need for a thermocouple (important when sensor breaks). After reversing, all LED light up and the position can be chosen. Value 100 means constant heating, value 50 means that the processes of turning on and turning off take equally long. The clock speed is entered. A set point is not considered. The temperature and the set value are displayed alternately. Change over to the automatic mode by pressing key > O <.
6. Turning on/Turning off: The instrument can be turned on and off by plucking in the power supply plug or pulling it off. Furthermore, there is the possibility of turning the instrument off while it is connected with the voltage supply. Therefore, key >F< and key > ^ < have to be pressed at the same time and for 5 seconds. After turning the instrument off, only a decimal point can be seen. The instrument is turned on by pressing key >F< for 5 seconds.
7. Alarm outputs: Optionally the instrument can also be delivered with a socket for alarm outputs. The contact is closed by alarm (alarm 1, 2 and sensor breaks).
8. A fuse is installed inside as protection, if the current is more than 5 amperes. Attention: The relay can switch only resistive load (ohm-resistance)! Don't regulate transformer and systems with more as 5 amperes. Working temperature: -10 to +40°C

We recommend the adjustment with auto- and self-optimization respectively; for further information please see attached instruction.

### Protection against manipulation of the parameters

To deactivate the protection:

Press the F-key as long as „PAS“ appears. With the up and down key type the number 99, afterwards press F key until „Pro“ appears. Type there the number 00. After renewed long pressing of the F-key, the menu is left and the protection is deactivated.

You activate the protection like follows:

Press the F-key as long as „PAS“ appears. With the up and down key type the number 99, afterwards press F key until „Pro“ appears. Type there the number 28. After renewed long pressing of the F-key, the menu is left and the protection is activated.