

Control & monitoring

Microprocessor-controlled devices

Controller Type WRF00096



Advantages

- Two-position controller for two to four separate channels (heating circuits)
- Self-optimization algorithm (PID) with separate activation per channel
- Easily readable 7-segment LED displays with 13 mm character size
- Display of actual and setpoint values
- Clear design of operator control level
- Each channel configurable as cut-out for permanent switching off

Areas of application

- All applications requiring high-quality control equipment
- Universally suitable for up to four different heating circuits
- For example, instead of four individual controllers
- Process technology
- Machine construction industry
- Analytical systems
- Plant engineering
- Equipment manufacture

Technical data

| | | | |
|-------------------|--|-----------------|---------------|
| Control behaviour | The control behaviour is configurable for channel 1 to channel 4 | | |
| | Two-position action for heating with adjustable hysteresis Two-position action for cooling with adjustable hysteresis Two-position action for heating with PID control characteristic Two-position action for cooling with PID control characteristic | | |
| | In the case of control behaviour with PID control characteristic: self-optimization at operating point by oscillation method | | |
| Inputs | Possible inputs: channel 1 to channel 4 | | |
| | Pt 100: | Measuring range | -100...600 °C |
| | Input 1 and 2 are three-wire inputs Input 3 and 4 are two-wire inputs | | |
| | Thermocouple: NiCr-Ni, type K | Measuring range | 0...1200 °C |
| | Standard signal: Current Voltage Mixed inputs or other inputs upon enquiry | | |
| | Start/stop function configurable via digital input, level or edge-triggered | | |
| | Start/stop function configurable via digital input, level or edge-triggered | | |
| Outputs | 4 control contacts or limit-value make contacts Configurable switching performance for limit-value contacts with/without interlock Output states configurable for fault occurrence | | |

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|---|---|---|
| Options | Logic outputs for triggering solid-state relay instead of control contacts K1 to K4, typically 0/10 V DC, max. 20 mA | |
| Standard | Easy-to-install and easy-to-service pluggable screw connection 2 displays for actual and setpoint values Display selection for channel 1 to channel 4 by means of channel selector button | |
| | Upper display | : actual value with channel number |
| | Lower display | : setpoint value without channel number |
| | Scan mode | : continuous indication of actual and setpoint values |
| | Static mode | : any 2 actual values with channel number |
| Possible extras | Additional relay card with 4 programmable relays | |
| | Reference channel of limit-value contacts selectable | |
| | Available functions | |
| | | - Absolute limit value |
| | | - Absolute limit value, inverted |
| | | - Limit value linked to setpoint |
| | | - Limit value linked to setpoint, inverted |
| | | - Limit comparator |
| | | - Limit comparator, inverted |
| | 3 outputs analogue actual value | |
| | Output quantity for each output depending on customer's specification | |
| | | 0...10 V DC / 0...20 mA DC |
| | | 2...10 V DC / 4...20 mA DC |
| | | configurable |
| | | 0...5 V DC / 0...10 mA DC |
| | | 0...2 V DC / 0... 4 mA DC |
| | | Interface RS 232 or RS 485 |
| For Pt 100 (two-wire/three-wire technique) | Sensor current | : approx. 1 mA DC |
| | Calibration accuracy | : ≤ 0.15% of span |
| | Linearity error | : ≤ 0.1% of span |
| | Temperature drift characteristic | : ≤ 100 ppm/K |
| | Sensor break and short-circuit protection included | |
| For thermocouple | Calibration accuracy | : ≤ 0.15% of span |
| | Linearity error | : ≤ 0.15% of span |
| | Temperature drift characteristic (without reference junction comp.) | : ≤ 80 ppm/K |
| | Influence of line resistance | : ≤ 2 µV/Ohm |
| | Reference junction compensation included | |
| | Sensor break and polarity reversal protection included | |
| For standardized signal | Calibration accuracy | : ≤ 0.15% of span |
| | Linearity error | : ≤ 0.15% of span |
| | Temperature drift characteristic | : ≤ 100 ppm/K |
| | Polarity reversal protection included | |
| Standardized signal of current | Input resistance | : $R_i = 100 \text{ Ohm}$ |
| Standardized signal of voltage | Input resistance | : $R_i > 10 \text{ kOhm}$ |

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|---------|---------------------------------|---|
| General | Measuring cycle | : 1 s |
| | Resolution | : > 19 bit |
| | Zero point correction | : ±30 K possible via software |
| | RC and diode protection circuit | : optional for each input |
| | Measuring circuit monitoring | : Error display |
| | Protective circuit | : Hardware watchdog and power fail |
| | Data backup | : EEPROM |
| | Operating voltage | : 230V AC ±10%, others upon enquiry |
| | Logic output of current | : Load < 400 Ohm |
| | Logic output of voltage | : Resistance R _i 500 Ohm (short-circuit proof) |
| | Relay outputs | : Contact loading: < 250 V AC, < 8 A ohmic load typ. 500 VA at 10 ⁶ operating cycles |

Electromagnetic compatibility

| | | |
|--------------------------|--|---------------|
| Emitted interference | Industry | EN 50 081-2 |
| Immunity to interference | Trade | EN 50 082-1 |
| | Industry | EN 50 082-2 |
| | | IEC 801-2 |
| | | IEC 801-3 |
| | | IEC 801-4 |
| Applicable EU Directives | Electromagnetic Compatibility (EMC) Directive (89/336/EEC) Low Voltage Directive (73/23/EEC) | |
| Safety class | II | |
| Insulation group | C according to DIN VDE 0110 b | |
| Protection standard | According to DIN VDE 0470 (replacing DIN 40050) EN 60 529 / IEC 529 | |
| | Front part | : IP 50 |
| | Housing | : IP 30 |
| | Connections | : IP 20 |
| Housing | Control panel housing for control panel fitting according to DIN 43 700 with fastening element B according to DIN 43 835 (screw clamp M4) | |
| Material | PPO, glass-fibre reinforced (Noryl GFN2SE1) Self-extinguishing, non-drip Fire protection class UL 94V1 | |
| Front frame size | 96 x 96 mm DIN 43 700 | |
| Panel opening | 92 ^{+0.8} x 92 ^{+0.8} mm | |
| Useful depth | Approx.. 148 mm incl. pluggable screw connector | |
| Connections | Pluggable screw terminal blocks, nominal cross-section 2.5 mm ² (finely stranded) | |
| Environmental conditions | Working temperature range | : 0...50 °C |
| | Storage temperature range | : -30...70 °C |
| | Climatic utilization category according to DIN 40 040 corresponding to 75 % rel. atmospheric humidity without moisture condensation | |

If desired, the device can be factory-terminated for your specific application.

● **Ordering data**

| Temperature range (configurable) | Sensor model | Type |
|-------------------------------------|----------------|--------|
| -100 ... 600 °C | Pt 100 | WRP 96 |
| 0 ... 1200 °C | NiCr-Ni, Typ K | WRN 96 |