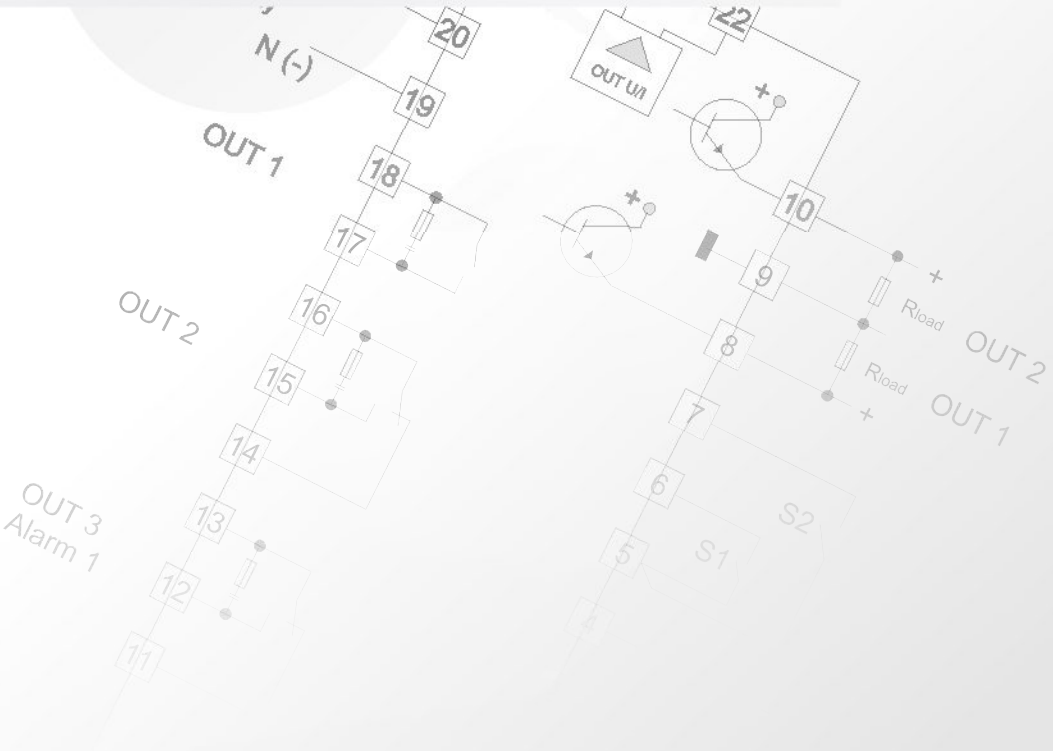
Controller 2000



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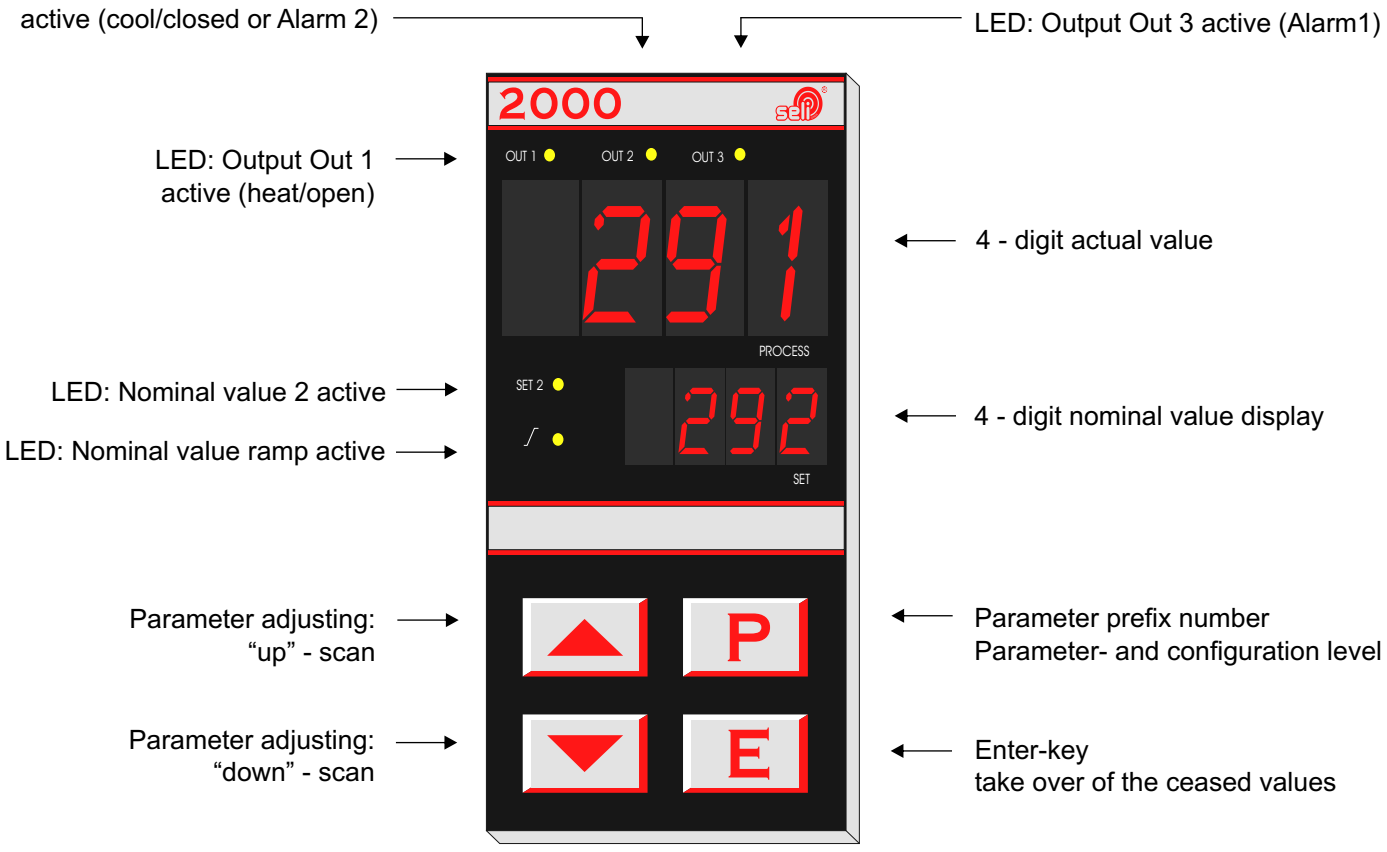

- The handling of the controller is splitted to 3 levels and takes place with a clearly formed foilkeyboard in the scanning-procedure.

- In operation nominal- and actual value will be displayed simultaneoust.
  All datas will be termed by logical short-cuts.

- The Control levels can be safed against unauthorized programming.
- In the working level are additional graduations possible.

Configuration level
for functions determination of the controller

- control type
  2-point
  3-point
  3-point-step
  steady
- Measuring transducer:
  thermal element
  Pt 100
  0/4...20mA
  0...10 V DC
- Function and circuit behaviour of the alarmcontacts

Parameterlevel
for adaption to the control way

- initiate self optimization
- adjust control parameter:
  xp, Tv, Tn

Working level
for process management

- Actual value display
- nominal range adjustment
- Alarm value adjustment

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Technical Data

Transducer

- Thermocouple

Sensor-break protection and internal reference junction installed.
Reverse voltage protection, if x < = °C
Accuracy of calibration: </= 0.25 %

- **PT100 (DIN)**

Two- or three-wire circuit
Sensor-breakage monitoring and short-circuit monitoring at hand.
Allowable line resistance (max.):
With three-wire circuit: 80 ohms
Accuracy of calibration </= 0.2 %

- **Standard signals**

0...20 mA; 4...20 mA (Ri = 10ohms)
0...10 VDC (Ri = 10 kohms/V)
Accuracy of calibration: </= 0.2 %
Start of the range: min. -999
End of the range: max. +9999
Coverage of the range: max. 2000 digits
Decimal place: 2 max.
Linearity error </= 0.2 %
Effect of the ambient temperature: </= 0.01 % /10 K

Adjustment outputs

- **Out 1**: Relay (normally open switch)
- **Out 2**: Relay (two way switch)
  Max 250 VAC, 3 A resistive load
- **Out1/ Out2**: voltage bistable
  0/18VDC; max. 10mA, short-circuit proof
  direct-connected with input
- **Out 1**: continuous
  0...20 mA load 500 ohms max.
  4...20 mA load 500 ohms max.
  0...10 VDC load > 500 ohms

Alarm outputs

- **Out 2**: relay (two-way switch)
  Max 250 VAC, 3 A resistive load
- **Out 3**: Relais (Wechsler)
  Max 250 VAC, 3 A resistive load

Allowable ranges of application

Working temperature range: 0...50 °C
Storage temperature range: -30...+70 °C
Klim. user class KWF, Din 40040

CE-approved

Data back-up

EAROM

7-segments display

10 mm red (process)
7,6 mm red (set)

Auxiliary voltage

- 230 VAC, (internally replugable to 115 VAC)
- -10...+10 %, 48...62 Hz
- 24 VDC; -20...+20 %

Allowable residual ripple 5 % max.
Influence on the control accuracy by the changes in auxiliary voltage: 0.01 % / 10 %
Power input: circa 4.5 VA

Electrical couplings

Screw clamps
Protection class: IP20, Din 40050
Insulation group C

Front
Protection class IP54, Din 40050

Case:
Material: Noryl, self-extinguishing not dripping,
Flammability class UL 94-1
Colour: black/ front black/red with seli logo
Protection class: IP20, Din 40050
Fitting position: any
Device installation: frontal, changeable
Switchboard section: (92 mm+0.8 mm)x(45 mm+0.6 mm)
Fixing element: 2 pieces (top/bottom)

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Abstract

Using the latest technology, the controller 2000 achieves a future-oriented functionality and operational reliability. The equipping of the printed circuit boards is carried out automatically. The final assembly of the controllers is conducted at the company Seli GmbH in Neuenkirchen.

The series 2000 reduces for the user:
- order expenditure and storage expenditure
- broad model ranges
- training expenditure and documentation expenditure

Free configurable are:
- control action
- adjustment characteristic
- type of adjustment output
- transducer and control range
- type and function of the alarm contacts

Control action
Two position-/three position position controller action, three Position step by step controller action or continous action Controller action are adjustable by the user.

The controllers have 3 standard outputs
- Out 1: “heating up” of the adjustment output i.e. “open”
- Out 2: “cooling down” of the adjustment output i.e. “Closed”
- Out 3: alarm output (see alarm contacts)

Here, the outputs Out1 and Out 2 are as a rule designed as relay Outputs and bistable voltage outputs.

Adjustment characteristicT
The adjustment characteristic of the controller is adjustable.
Two-position controllers, three-position controllers and continuous action controllers:
PD/I (starting-up without overshooting, controlling without deviation)
PD-, PI-, P- or On/Off with self-optimization.
Here, a decreasing (heating) or an increasing (cooling) characteristic curve can be dedicated to the two-position control or the continuous action control.

Three position step by step controllers
The three-position step-by-step controllers show PI action in association with motor actuators.
Switching point distance (neutral zone) and differential gap are programmable.
The optimal control parameters are determined by the activation of the self-optimization. The adjustment outputs “Out1/Out2” can be manually activated via the keys “up/down“ after switching to manual operation.

Self optimization
The self-optimization facilitates the adjustment of the controller to the controlled system. On demand (keystroke), the controller identifies in the closed loop system the characteristics of the controlled system and generates traceability parameters which are valid within an additional range.

Serial interface
For the central control and monitoring of the control process a RS 485 interface is provided optionally.

Transducers
As transducers, all established thermocouples, resistance thermometers (PT100) and standard signals can be connected.
Via 9 selectable measuring ranges a maximum resolution of the measurement signal is achieved.
- Fe-CuNi (L) 0...400 °C; 0...800 °C
- Type J 0...800 °C
- NiCr-Ni (K) 0...1200 °C
- Pt10Rh-Pt (S) 0...1600 °C
- PT100 -50...+100 °C; -90...+205 °C
- PT100 0...400 °C; 0...800 °C

The values can also be displayed in °F.
The standard signals are programmable into initial value of the range and final value of the range (also with decimal place).
0...20 mA; 4...20 mA; 0...10 VDC

Nominal value
For the setting range limitation a minimum value and a maximum value can be defined.
For the decrease or the increase of the temperature a 2. digitally preselectable desired value can be programmed. This desired value is activated via the closing of an external floating contact.
Programmable Sollwertrampe
For the time-controlled starting-up of the desired value one separate gradient (K/min) for both the desired value increase and the desired value decrease can be programmed.

Programmierbare Sollwertrampe
Zum zeitgesteuerten Anfahren des Sollwerts kann je ein separater Gradient (K/min) zur Sollwerterhöhung, als auch zur Sollwertabsenkung programmiert werden.

Actual value offset
For the temperature actual value adjustment or for the line balancing an actual value offset is adjustable.

Alarm contacts
Depending on the controller configuration one or two alarm contacts serially are at disposal:
- two-position controller: 2 alarm contacts
- Continuous action controller: 2 alarm contacts
- three-position controller: 1 alarm contact
- three-position step-by-step controller: 1 alarm contact

The type and the switching function of the alarm contacts are programmable.
Available are:
-Signalkontakt (desired value based; on/off or off/on - switching)
-limit contact (actual value based; on/off or off/on - switching)
-Limit comparator (desired value based; on/off/on or off/on/off - switching)
The limit comparator is also programmable with an alarm suppression during the starting-up phase.

Starting-up circuit
For the slow drying up of high performance heating cartridges a starting-up circuit is configurable. The application extends the durability of the cartridges by heating them up very carefully.

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Microprocessor navigated universal controller type 2000

The controller 2000 is a microprocessor-controlled Universalregler sized 96*48mm.Because of its modularity it is appropriate for many applications in the industry. The following parameters are freely configurable:

- Control action
- Adjustment characteristic
- Type of adjustment output
- Transducer and control range
- Type and function of the alarm contact

For further data please see data sheets.

Order-code:

Auxiliary supply

-1 230 VAC switchable internal to115 VAC

-2 24VDC

Output

-A switching controller Relay (max 250VAC, 3A) and voltage bistable (0/18VDC)

-B switching and steady working controller Relay (max 250VAC, 3A) and voltage, bistable (0/18VDC) and current (stetig 0/4...20mA) and voltage (steady 0...10VDC)

Interfaces

0 without interface

-1 with interface serial RS485

Supplies

FK Frontadapter for 96*96mm installation (material plastics)

FA Frontadapter for 96*96mm installation (material aluminium)

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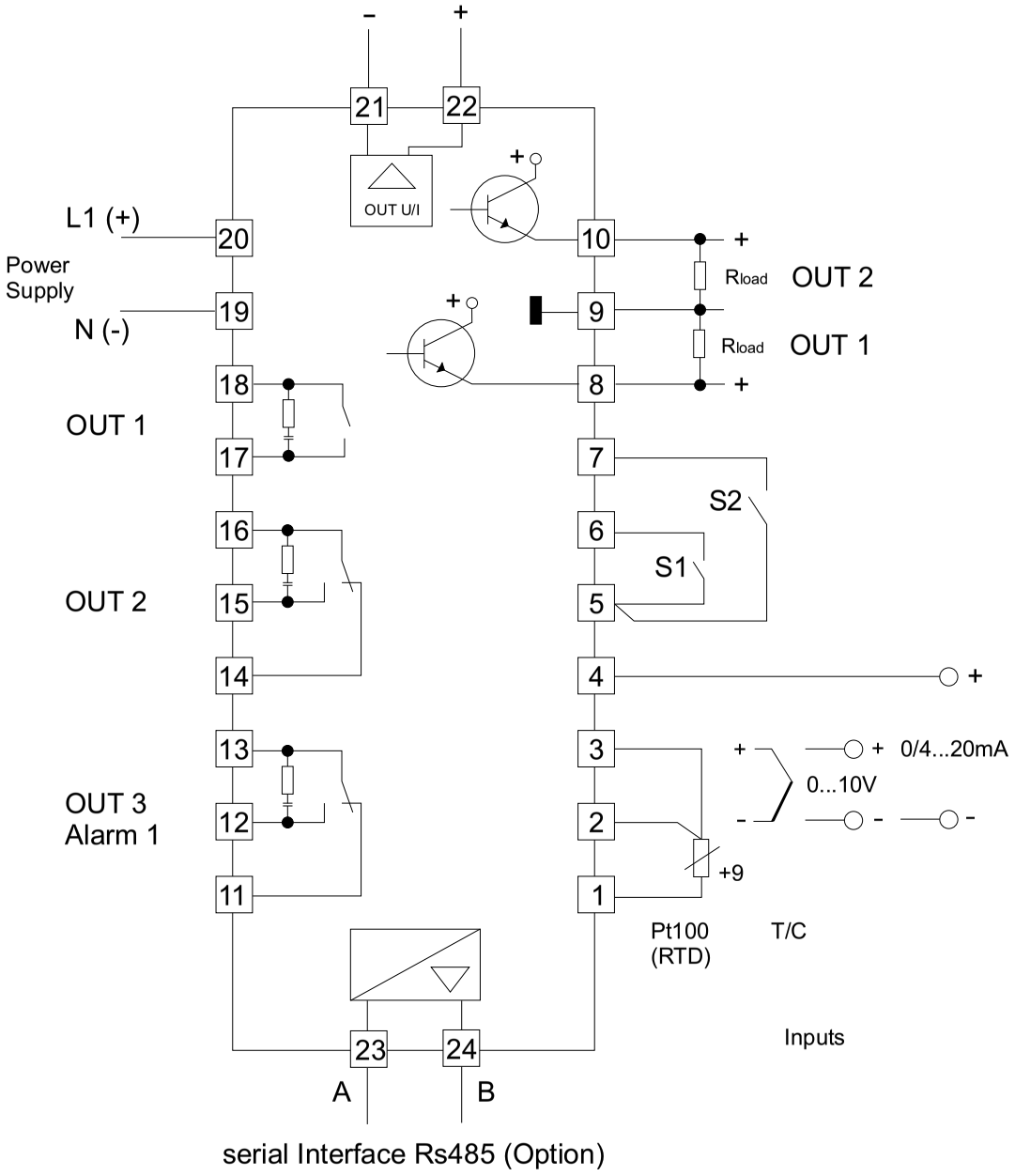
CONTROLLER Connection drawing



Output OUT 1

Two point-/steady controller: “heating” resp. “cooling”
Three point controller: “heating”
Three point step controller: “open”

Output or alarmoutput OUT 2

Two point-/steadycontroler: Alarm 2
Three point controller: “cooling”
Three point step controller: “shut”

Nominal value controlling

S1: open = Sp1 valid
S1: shut = Sp2 valid

Adjustment blockage (LOC)

S2: open = Adjustment lock only with “Softwarecode”
S2: shut = Adjustment locked (according to the chosen softwarecode)