

## Temperature Controller vtr-pt, vtr-pt-sa

### General Function

The temperature controller vtr-pt is used for simple temperature controlling and monitoring in conjunction with a temperature sensor Pt100 or with a thermocouple. The switching function of the output relay is switchable ("max/min"). In the setting "max" the relay is on as soon as the temperature exceeds the value set on the scale. In the setting "min" the relay is off (safety function). The difference between the values which the relay is on and off is the hysteresis. The amount of the set hysteresis is 2% and can be increased to 10% max. If there is a failure of the temperature sensor, the LED "F-br" (red) is active (open circuit alarm). Additionally the controller vtr-pt-sa has an analog output (0-10V and 0/4-20mA) for transferring the temperature signal to further evaluation devices (e.g. digital indicator dem-49). Furthermore the controller is furnished with a relay output that switches off if there is a failure of the temperature sensor (red LED "F-br." is active).

### Features

- different measurement inputs possible
- Pt100 switchable in 3-wire- or 4-wire-connection
- inverse gate of the relay function
- hysteresis adjustable
- plug-in terminal connections
- monitoring of temperature sensor (relays switch off)

### Options

- thermocouple inputs FeKo and NiCr-Ni
- integrated analog output and open circuit output (vtr-...-sa)



vtr-pt-sa

### Specification

Housing	DIN standard case	ABS f. snap mounting as per EN50022
	dimensions	45x75x105mm (WxHxD)
Type of Protection		IP20, terminals guarded
Ambient	operating temp.	-10...+55°C
	shelf temperature	-20...+70°C
	humidity	0...95%
Input	Pt100	3/4-wire connection switchable (S3)
	thermocouples	FeKo or NiCr-Ni optionally
Output	1x relay contact	max. 250V/3A AC change over contact
Hysteresis	adjustable	0,8...10% of full scale (standard set.=2%)
Switching function	min / max	switchable
Accuracy	poti	1% typ., 2%,max, reproducibility 0,3%
	temperature drift	0,01% /K
Supply voltage	AC	24, 42, 110, 230V AC, 47...63Hz, 3VA,
	DC	24V DC 80mA max, -10%/+15%

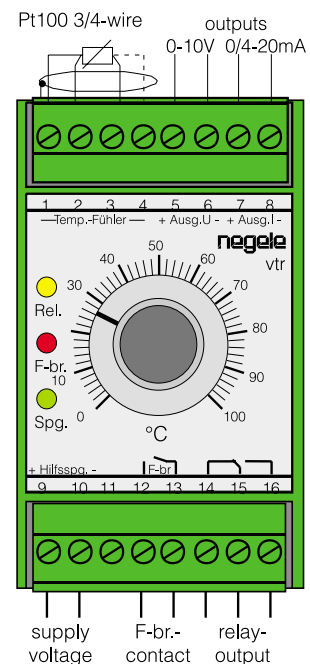
### Option Analog Output and Open Circuit Relay (vtr-...-sa)

Output	current	0/4-20mA	burden res. ≤500Ω
	voltage	0...10V	load >1kΩ
Accuracy	input Pt100 typ.	±0,2% of full scale, max. 0,3%	
	input thermoc. typ.	±0,5% of full scale, max. 1%	
Open circuit output	1x NOC	250V/3A AC max	

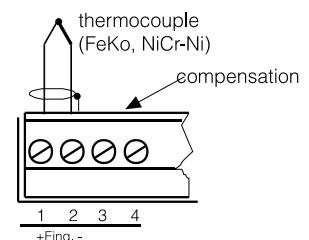
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All data subject to change and errors excluded

### Connecting Diagram vtr-pt-sa



### Connect. vtr-fk (FeKo) and vtr-nc



### Order Markings and Types

range	curr. outp./open circ.	24V AC	115V AC	230V AC	24V DC
0-50°C	— / F-br.-LED	vtr-pt 0-50 24VAC	vtr-pt 0-50 115VAC	vtr-pt 0-50 230VAC	vtr-pt 0-50 24VDC
0-50°C	0/4-20mA / F-br. contact	vtr-pt-sa 0-50 24VAC	vtr-pt-sa 0-50 115VAC	vtr-pt-sa 0-50 230VAC	vtr-pt-sa 0-50 24VDC
0-100°C	— / F-br.-LED	vtr-pt 0-100 24VAC	vtr-pt 0-100 115VAC	vtr-pt 0-100 230VAC	vtr-pt 0-100 24VDC
0-100°C	0/4-20mA / F-br. contact	vtr-pt-sa 0-100 24VAC	vtr-pt-sa 0-100 115VAC	vtr-pt-sa 0-100 230VAC	vtr-pt-sa 0-100 24VDC
0-200°C	— / F-br.-LED	vtr-pt 0-200 24VAC	vtr-pt 0-200 115VAC	vtr-pt 0-200 230VAC	vtr-pt 0-200 24VDC
0-200°C	0/4-20mA / F-br. contact	vtr-pt-sa 0-200 24VAC	vtr-pt-sa 0-200 115VAC	vtr-pt-sa 0-200 230VAC	vtr-pt-sa 0-200 24VDC

### Trimmers and Switches

name	function	setting
S1	current output (0/4mA)	0-20mA / 4-20mA (only ...-sa)
S2	function switching output	min / max
S3	input selection Pt100 (3/4-wire)	3-wire / 4-wire
P1	zero setting (N)	do not change
P2	gain setting (V)	do not change
P3	hysteresis switching output	0,8...10%

### Settings and Starting Instructions

1. Set device with switches S1...S3 according to table mentioned above.
2. Connect temperature sensor or simulator (e.g. hsm-p) to input (if Pt100 pay attention to 3-wire or 4-wire-connection, see setting of S3).
3. Apply supply voltage (terminals 9/10).
4. Set switching temperature you need (e.g. 50°C) by means of potentiometer front side.
5. Increase or decrease temperature slowly to adjust setpoint and check the switching function (yellow LED is on, if relay is active).
6. Set with trimmer P3 the hysteresis you need (0,8... 10% of full scale) and check it by slowly varying the temperature (diagram 1+2).
7. Disconnect the Pt100 sensor and check the open circuit alarm (red LED is on, both relays are inactive).

### Option vtr-...-sa Analog Output and Open Circuit Alarm

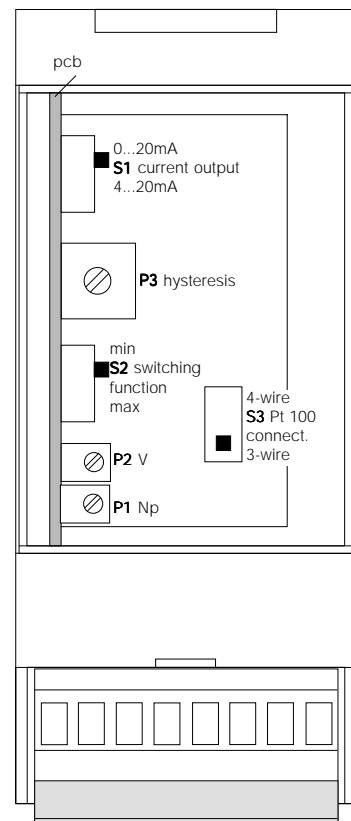
The analog output (e. g. 4...20mA) is corresponding to the whole temperature range of the controller (e. g. 0...200°C).

Controllers with analog output are furnished with an open circuit alarm, that is active when

- breakdown of supply voltage,
- short circuit of temperature sensor,
- open circuit of temperature sensor

and disconnect contact of terminals 12/13 and switches the relays "Ausgang" inactive (current and voltage output are switching to "0mA" or "0V" respectively).

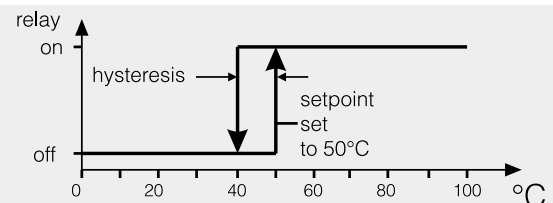
view vtr-pt-sa (cover open)



### Function Maximum Alarm

- switch S1: "max"
- setpoint: 50°C
- hysteresis P3: 10°C

Diagram 1



### Function Minimum Alarm

- switch S1: "min"
- setpoint: 50°C
- hysteresis P3: 10°C

Diagram 2

