

# Ex- B- Pt100 Ex- R- Pt100

Temperature controller and limiter



### Characteristics

- Digital controller / limiter for the Ex-area
- Operation is also possible in open condition
- Single or combination device
- Fault signal lamp on the cabinet + fault signal contact for the control room

### Field of application

The electronic temperature limiter is preferably designed for heat tracing in the Ex-area. The measured value acquisition results via a measuring sensor Pt 100. The measuring circuit is not intrinsically safe. The analysis complies with the relevant VDE-regulations for safety low voltage and guarantees the EMV-compatibility. The high protection class enables the operation under extreme conditions. A functional impairment due to condensation water accumulation is not given. The same applies to the version as controller.

The use of this device is particularly appropriate where capillary controller or rather limiters are only partially suitable. This is especially the case, when:

- the regulation or rather the monitoring must take place inside the plant.
- the measuring sensor is mounted away from the evaluation device.
- an additional potential-free contact for the failure report is necessary
- capillary limiters can not be used due to mechanical reasons.
- the maximum temperature lies more than 20% from the measuring range final value of the sensor system when flushing the pipeline.
- an additional limit value, preferably min. temperature, is necessary.

### TYPE CODE

The type code is also the complete ordering information:

Ex     Pt 100 K   AT              

1	B	Limiter
	R	Controller
2	Combination unit (e.g. Ex B R Pt 100 KCAT)	
3	A	Single device
	C	Combination device
4	Measuring range for controller / limiter / min- temperature	
	1	0-100°C
	2	0-200°C
	3	0-300°C
	4	0-400°C
	5	0-500°C
5	-	Standard ( only min.-temperature monitoring limiter)
	BoM	Limiter without min.- temperature monitoring
	RMx	Controller min.- temperature x - replace according to key 4
	BMx	Limiter min.- temperature x - replace according to key 4
6	-	Without fault signal lamp
	S	With fault signal lamp
7	M	M32 screw joint
	R	M32 reduction to M25
	B	Filler plug
8	-	Standard enclosure
	G	Big enclosure 260 x 160 x 90 mm (only for single units (combination device are always supplied in big enclosures))
9	-	Spring clips (Standard)
	Z	Tension spring terminals
10	-	Ambient temperature range -20°C (Standard) Plastic screw joint
	-40	Ambient temperature range -40°C (Metal screw joint)

### TECHNICAL DATA

Nominal voltage	230 V ~ +/- 10% (110, 130 V ) 50-60 Hz
Protection degree	IP65
Admissible ambient temperature range	-30 bis +50°C (-40 bis +50°C) (depending on cable gland)
Electrical connection	Terminals for 4 mm
Fixation KA	160 x 160 x 90 (140 x 110)
Input - Network	2,5 kV ~
Network - cabinet	2,5 kV ~
Input - cabinet	1,5 kV ~
Measuring sensor input	Temperature sensor Pt100
Measuring circuit	6 mA, 3-wire switch, Pt 100
Measuring circuit monitoring	all 3 lines
Line break	≥ 200 Ω for Pt100 (depending on measuring range) (or rather 20% above the measuring value range)
Line end	≤ 50 Ω (or rather 20% below the measuring value range)
Combination version KC	260 x 160 x 90 ( 240 x110)
Nominal current	20 mA (50 mA)
EC - type examination certificate	ISSeP08ATEX022X
Type of ignition protection (gas)	Ex e mb d IIC T4
Identification	 0344  II 2G Ex e mb d IIC T4

The complete Atex certification documentation can also be viewed at [www.erich-ott.de](http://www.erich-ott.de) as PDF-document.

## TECHNICAL DATA LIMITER / CONTROLLER

Setting range/ Scale	0..200/ 300/ 400 (600) °C
Limit adjuster	Precision pote; rotation angle 300°
Switching point accuracy	≤ 1,5%
Switching hysteresis	≤ 3K (for 200°C scale)
Limiter relay	1 potential-free switching contact 250 V ; 16 A (25 A) (max. inrush current impulse (4sec), no continuous operation)); cos φ ≥ 0,7; 4000 VA, (see load diagram)
Resetting	Tastschalter in Frontplatte des Moduls
Series fuse	≤ 16A
Requirement class	AK4

## TECHNICAL DATA SETPOINT VALUE MIN.-MONITORING

Setting range (Scale)	0-100/200/300/400 °C
Setpoint adjustment	Precision poti; rotation angle 300°
Switching accuracy	≤ 1,5 %
Switching hysteresis	≤ 2 K (for 100°C scale)
Fault signal	by fault signal relay d2
1 potential-free make-contact	250 V~ ; 5 A cos φ ≥ 0,7; 1250 VA; 30 V~; 5 A; 150 W

## FUNCTION

The limiter or rather the controller is mounted in a Ex „e“ terminal box. Standard size for single units: 160 x 160 x 90 mm. As combination device controller-limiter-unit in terminal box 260 x 160 x 90 mm. The adjuster can be found on the modules. (Alternatively also with outside adjuster for the temperature setpoint.) Sensor input, connection to supply system and contact outputs of the relays are wired on a terminal block. (Clamping range 4 mm²). The permissible upper limit temperature is adjusted at the limiter scale, 0..200 °C, or rather 0..300/ 400/ 600 °C, with the indicator pointer and this is covered with the twisting protection\*. The twisting protection is secured with sealing wax, if necessary. After exceeding the limit temperature the limiter relay d1 drops down. Via a safety switch the limiter relay remains in rest position\* until the failure has been remedied, and the limiter reset button has been used. Sensor line end or a line interruption releases the limiter and indicates a failure report.

With the 2. limit value, min.-monitoring, a drop of the temperature under a preset limit value can be recorded early enough to be able to eventually resolve the failure before a damage occurs. The adjustment of the temperature switching point is made at the min.-scale. Also available as usual switch-off function as precontact. Only takes effect on the fault signal relay.

\* only an option for the controller

The fault signal responds to any of the following errors: (drop in rest position).

Min.-temperature underflow
Limiter released
Measuring sensor short
Measuring sensor break
Measuring line interruption*
Measuring line end*
Voltage breakdown

\* no matter which of the 3 measuring lines is affected


## TEMPERATURE LIMITATION

The temperature limiter is equipped with an additional monitoring, which is switched on the fault signal relay, so that at safety related view VK4 or similar can be taken as a basis, but only if the integration and the construction of the heating installation is accordingly designed.

## AUTOMATIC RESTART AFTER POWER FAILURE OF THE LIMITER

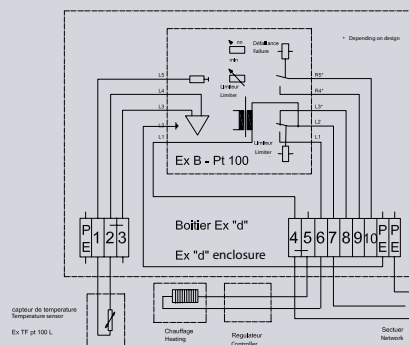
After breakdown of the limiter supply voltage all previous functions switch on again automatically when the power returns, if the limiter circuit is not blocked by a excess temperature release. This saves the maintenance personnel from resetting each individual controller by hand (limiter resetting).

## TYPE PLATE

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Regler + Begrenzer <b>Ex Pt100 K AT</b>			
1	Nennspannung	230V~	7
2	Schaltleistung	4000VA	
3	Messfühler	Pt100	8
3	Umgebungstemperaturbereich	- 0 - +50°C	9
4	Schutzart	IP 65	
4	ISSEP 08 ATEX 022X		
5	Fertigungs- Nr.:		10
	<b>II 2G Ex e mb d II C T4</b>		11

1-	Type designation	6-	Supervising agency
2-	Switching capacity	7-	Nominal voltage
3-	Ambient temperature range	8-	Measuring sensor
4-	Inspecting authority/EC-type examination certificate	9-	Type of protection
		10-	Serial device number
5-	Ex-Identification	11-	Type of ignition protection

## CONNECTION EXAMPLE EX B-PT100 KA



## MEASURING SENSOR

The Ex B Pt100, or rather the Ex R Pt100 makes two Pt100 inputs in 3-wire technique available, at which suitable temperature sensors can be operated in the potentially explosive atmosphere. The measuring sensor inputs are designed separately for controller and limiter and independent. We supply suitable, certified Pt100 sensors in two basic versions (see our product literature Ex TF.....).

Please take further data from the respective operation manual. Download on [www.erich-ott.de](http://www.erich-ott.de)