



Purpose and Application

Micro-processor based continuous blowdown controller for automatically controlled blowdown of steam boilers, evaporators or similar plants to reduce blowdown wastage. The controller type LRR 1-9 is used with the conductivity electrode type LRG 16-5/LRG 16-7 and the continuous blowdown valve Reactomat type BAE 36-1 to form a complete blowdown system.

Application in particular in plants operated automatically, e.g. in accordance with the regulations for operation without constant supervision (TRD 604).

Design

Case for panel mounting to DIN 43 700 for installation into panels of control desks or cabinets.

Operation

All boiler feedwater contains some solids in solution, such as water treatment chemicals. These impurities are continually concentrated in the boiler due to the evaporation process, i.e. the boiler water density (TDS level) increases. This effect affects boiler safety and can lead to boiler damage. The combination of controller type LRR 1-9, electrode type LRG 16-5/LRG 16-7 and continuous blowdown valve type BAE 36-1 ensures automatic and continuous blowdown of the steam boiler; the TDS level is kept within the permissible limits.

The controller is provided with an automatic temperature compensation. It ensures signalling of MIN/MAX limit values, a purging pulse for the blowdown valve every 24 hours and stand-by operation. Alarm is given when the MIN/MAX limit values are exceeded and if the electrode is defective. The controller has a current output (option) for remote indication or recording of the conductivity. On boiler shutdown the controller automatically closes the blowdown valve.

Technical Data

Input

Nine terminals for the connection of conductivity electrode type LRG 16-5/LRG 16-7.

Three terminals for the connection of feedback potentiometer (1000 ohm) (valve position).

One voltage input 24-230 V, 50-60 Hz for external command "VALVE CLOSED" or "CONTROL OFF".

Output

Two volt-free relay contacts for controlling the blowdown valve "OPEN/CLOSED" and "LOW".

Two volt-free relay contacts for signalling "MIN/MAX" limit values.

Contacts are cadmium oxide plated silver overlaid with a 5 micron thick layer of gold.

Max. contact rating 4 A (resistive) with switching voltages of 24 V, 115 V and 240 V a.c.; 0.75 A (inductive) $\cos\psi$ 0.5. Max. contact rating 4 A with a switching voltage of 24 V d.c.

To avoid damage to the gold plated contacts, the voltage and current applied must not exceed 24 V d.c. and 20 mA respectively.

To avoid contact welding, the mains supply should be protected with a 2.5 A fuse.

Current output 0 to 20 or 4 to 20 mA for remote indication, loop impedance not to exceed 750 ohm (option).

Measuring range

Three adjustable measuring ranges:

0 - 200 $\mu\text{S}/\text{cm}$	(0- 1000 ppm)
100 - 12000 $\mu\text{S}/\text{cm}$	(50- 6000 ppm)
0 - 20000 $\mu\text{S}/\text{cm}$	(0-10000 ppm)

Measuring range referred to 25 °C.

Set point (ppm)

Digitally adjustable over the complete measuring range between the set MIN/MAX limit values.

Temperature coefficient Tk (%/°C)

1. Tk hand: 0 %/°C to 5.0 %/°C.
2. Tk norm: 11 fixed temperature curves
3. Tk auto: automatic acceptance of the specific temperature curve of the installation.

MIN/MAX limit values (ppm)

Digitally adjustable over the complete measuring range.

Switching hysteresis

MIN limit value: +0.5 % of measuring range
 MAX limit value: -0.5 % of measuring range
 Control output: -10 % of set-point value, if configured as two-position controller

Code number

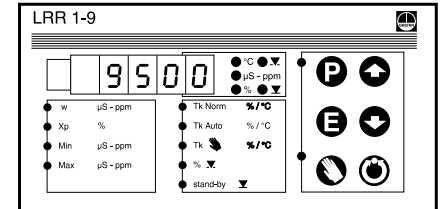
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Proportional band Xp (%)

1 to 150 % for proportional control
 0 % for two-position control

Low position of continuous blowdown valve (%)

0 % to 25 % corresponding to 0 to 25 scale divisions



LRR 1-9 e

B₁

LRR 1-9



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Flow Control Division

Purging pulse

for the continuous blowdown valve every 24 hours.

Indicators and adjustors

Five-digit, seven-segment display for indication of ppm (temperature-compensated), fluid temperature and valve position.

Three LEDs for indication of ppm, temperature and valve position.

Two LEDs for indicating valve positioning direction.

Nine LEDs for indicating selected parameters. Six membrane keys for parameter selection and set values and for auto/manual operation. One dip switch for preprogramming (rear of controller).

Electrode supply voltage

30 V d.c.

Measuring voltage

$U_u < 5$ V d.c.

$U_i < 5$ V d.c.

Test current Pt 1000

< 1 mA

Mains supply

230 V ± 10 %, 50/60 Hz, 5.7 VA.

The power transformer is provided with each winding in a separate housing in acc. with VDE 0551 and protected from inner and outer shortcircuits by an excess temperature fuse.

Special voltage:

24 V ± 10 %, 50/60 Hz or
110 V ± 10 %, 50/60 Hz.

Protection

IP 40 for front panel

IP 00 for rear terminal panel

Permissible ambient temperature

0 °C to 55 °C

Weight

Approx. 1.0 kg

Important Notes

Cable required for wiring: Use an eight-core overall screened cable, minimum conductor size 0.5 mm², max. cable length 100 m.

Order and Enquiry Specifications

Continuous blowdown controller type LRR 1-9e with automatic temperature compensation. Case for panel mounting to DIN 43 700 for installation into panels of control desks or cabinets.

Measuring range μ S/cm

Mains supply V, 50/60 Hz.

Associated Equipment

Conductivity electrode type LRG 16-5.

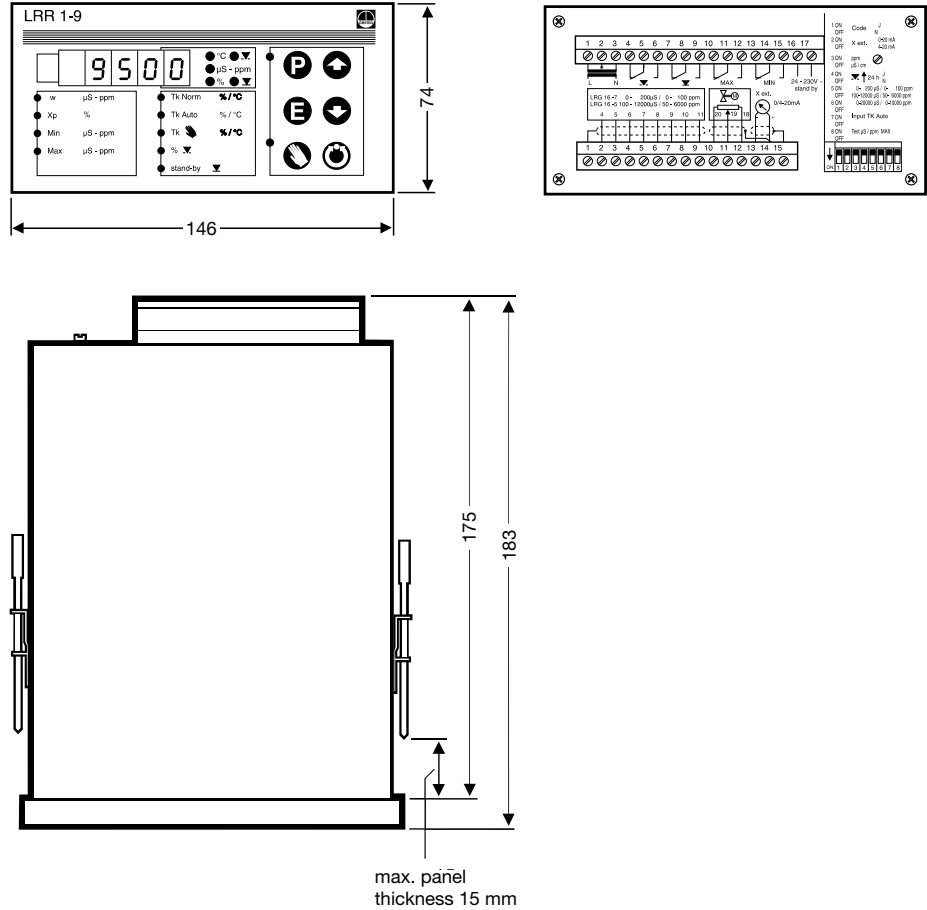
Continuous blowdown valve type BAE 36-1.

Supply in accordance with our general terms of business.

Technical modifications reserved.

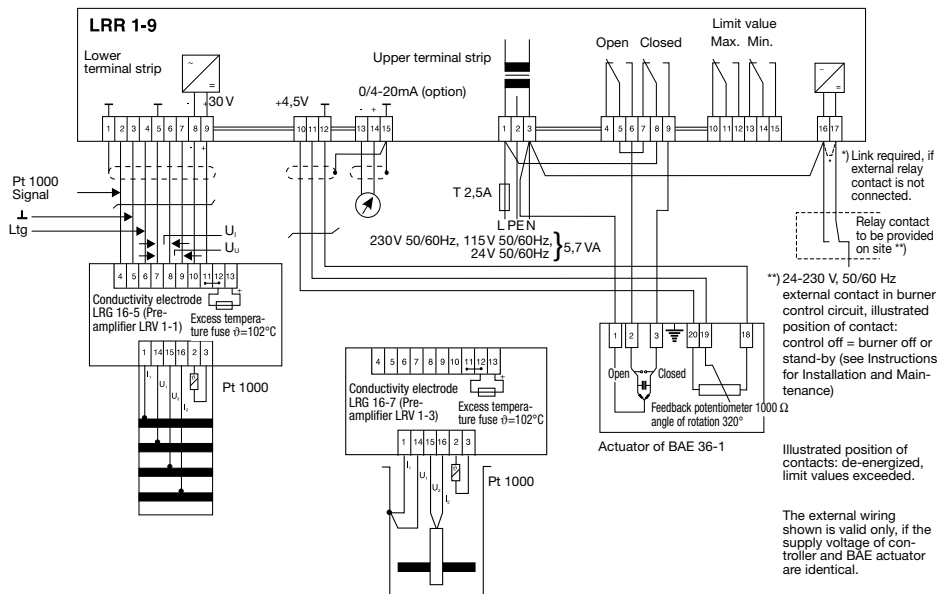
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Dimensions



Dimensions of continuous blowdown controller type LRR 1-9e

Wiring diagram



Wiring diagram for continuous blowdown controller type LRR 1-9e