GESTRA Steam Systems

Product Range B

Conductivity (TDS) Controller and Limiter / Intermittent Blowdown Cycling Timer

LRR 1-40

LRR 1-40

CAN-Bus

Description

The continuous blowdown controller LRR 1-40 used in conjunction with the conductivity sensing electrode LRG 16-40 constitutes a conductivity (TDS) monitoring and control system. Electrical conductivity is used to measure boiler water TDS (= Total Dissolved Solids). The blowdown controller features the following functions:

- Two conductivity limits with one switchpoint each: TDS high (MAX) alarm and TDS low (MIN) alarm. The TDS low (MIN) alarm can alternatively be used to control an intermittent blowdown valve.
- Three-position control within a predefined proportional band.
- TDS level (conductivity) monitored and maintained within a predefined control range.
- Stand-by input.
- 24 h purging pulse for continuous boiler blowdown.

The LRR 1-40 can, by choice, be provided with an actual value output with a standard signal of 4 - 20 mA. The TDS data are transferred to the controller or another system component via a CAN data bus. The controller and the conductivity sensing electrode use the CANopen protocol.

Function

At regular intervals the conductivity sensing electrode LRG 16-40 sends a data signal to the blowdown controller LRR 1-40. The data transfer is effected by means of a CAN bus according to DIN ISO 11898 using the CANopen protocol. The transferred measuring data are evaluated and assigned to the control range and the switchpoints. A standard output signal of 4-20 mA (optional extra) is provided for external conductivity (TDS) indication. The control terminal and display unit URB 1 can be used to manually set a de-energizing time delay for the relay. To guarantee the correct and fail-safe operation of the system the data transmitting cycle is constantly monitored by the TDS controller. If the CAN bus line is interrupted, the TDS controller sends a visual signal to indicate a malfunction and the relays 1 and 4 will be instantaneously de-energized (fail-safe position).

The additional control terminal and display unit URB 1 permits a second water level indication and a continuous display of the actual TDS – i. e. conductivity – value in accordance with WÜL 00.

Design

LRR 1-40b

Enclosure of insulating material with terminals for installation in control cabinets. The terminals are externally accessible.

Clipping onto a 35 mm standardised supporting rail TS 35 x 15 to DIN EN 50022.

External dimensions: 100 x 73 x 118

CAN Bus

All level and conductivity switches, controllers and electrodes are interconnected by means of a CAN bus. The data exchange is effected by means of a CAN bus according to DIN ISO 11898 using the CANopen protocol. Every item of equipment features an electronic address (Node ID). The four-core bus cable serves as power supply and data highway for high-speed data communication.

The LRR 1-40 is configured at our works and ready for service with other GESTRA components.

The LRR 1-40 can be used straight away without having to set the Node ID.

Technical Data

Type approval
TÜV· WÜL·02-007
BAF-MUC 02 05 103881 003

Input
Interface for CAN bus to DIN ISO 11898, CANopen protocol.
Feedback potentiometer 1000 Ω.
Voltage input 24 V – 230 V, 50 – 60 Hz for external command “Close valve” or “Control off” – stand-by –.

Output
Power supply 24 V DC, short-circuit protected.
Analogue output 4 - 20 mA, load 750 Ω for actual value indication (optional extra).
20 mA depending on range 20, 100, 200, 500, 1000, 2000, 6000, 12000 µS/cm.
Four volt-free relay contacts.
Max. contact rating with switching voltages of 24 V AC, 115 V AC and 230 V AC:
resistive 4 A, inductive 0.75 A at cos φ 0.5.
Max. contact rating at a switchting voltage of 24 V DC: 4 A
Contact material: silver, hard-gold plated

Relay de-energizing delay
Output “MIN”, “MAX” 3 sec. (factory setting)

Indicators and ajustors
One red LED for switchpoint MAX (TDS HIGH)
One red LED for switchpoint MIN (TDS LOW) or for intermittent blowdown control.
Two green LEDs for deviations “X_w MIN” and “X_w MAX”.
One green LED “Power on”
One red LED “Bus malfunction”.
One ten-pole code switch “Node ID”, “Baud rate”,
Four push-buttons.

Setpoint
Setpoint W continuously adjustable within the whole control range between the adjusted MAX/MIN limits

Dead band
W < 2000 µS/cm = 3 %
W > 2000 µS/cm = 1 %

Switching hysteresis
1 – 25 % of setpoint W

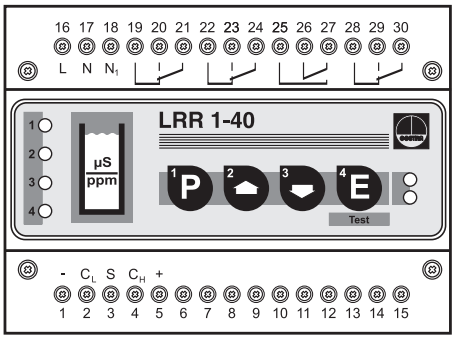
Proportional band X_p
1 – 150 % referred to W
0 % (factory setting)

Switching hystereses of MAX/MIN limits
MIN +1 %, MAX –1%

24 h purging pulse BAE
Automatic intermittent boiler blowdown
(MIN contact used for a timed output to control the purging intervals of bottom blowdowns)
Frequency: 1 – 120 h, in steps of 1 h in 1 sec.
Duration: 1 – 60 sec.

Control characteristic
Proportional controller for two- or three-position control

Proportional band X_p
1 – 100 %



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LRR 1-40 CAN-Bus

Technical Data – continued –

Position feedback X_r
0 – 1000 Ω

Switching range (dead band) X_{Sh}
3 %

Supply voltage
230 V +/– 10 %, 50/60 Hz
115 V +/– 10 %, 50/60 Hz (optional)

Power consumption
5 VA

Protection
Casing: IP 40 to DIN EN 60529
Terminal strip: IP 20 to DIN EN 60529

Admissible ambient temperature
0 – 55 °C

Enclosure material
Front panel: polycarbonate, grey
Casing: polycarbonate, black

Approx. weight
0.8 kg

Important Note

Note that multi-paired control cable, e. g. UNITRONIC® Bus Can 2 x 2 x ...mm² is required. Alternatively RE-2YCYV-fl 2 x 2 x...mm² can also be used. Max. cable length 125 m at 250 kBit/s.

The bus **must** be wired in series. Star-type wiring (point-to-point) is **not** permitted.

Standard values for cable lengths between two bus-based devices (length of segment) and for conductor sizes as specified in ISO 11898:

Length of segment [m]	Number of pairs and conductor size [mm²]
up to 300	2 x 2 x 0.34
300 to 600	2 x 2 x 0.5
600 to 1000	2 x 2 x 0.75

To protect the switching contacts provide circuit with a 2.5 A anti-surge fuse or – according to TRD regulations – with 1.0 A for 72 hrs operation.

Order and Enquiry Specification

GESTRA TDS controller LRR 1-40 CANopen

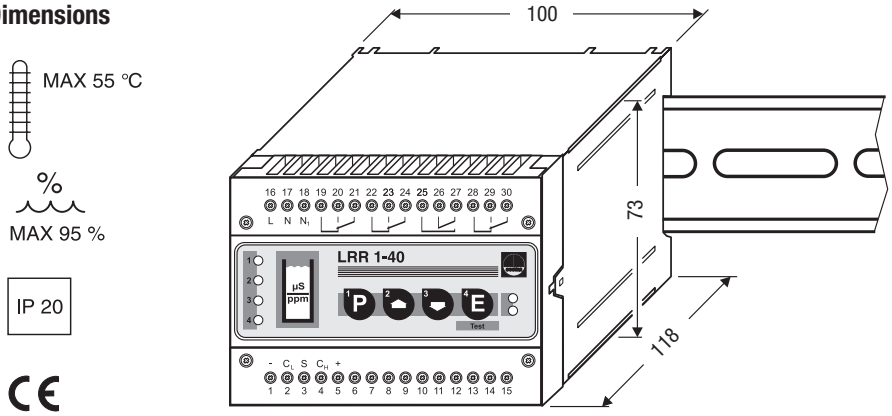
Mains voltage V

Ancillary Unit

- Conductivity sensing (TDS) electrode LRG 16-40 CANopen
- URB 1 as easy-to-use control terminal and display unit for LRR 1-40 CANopen

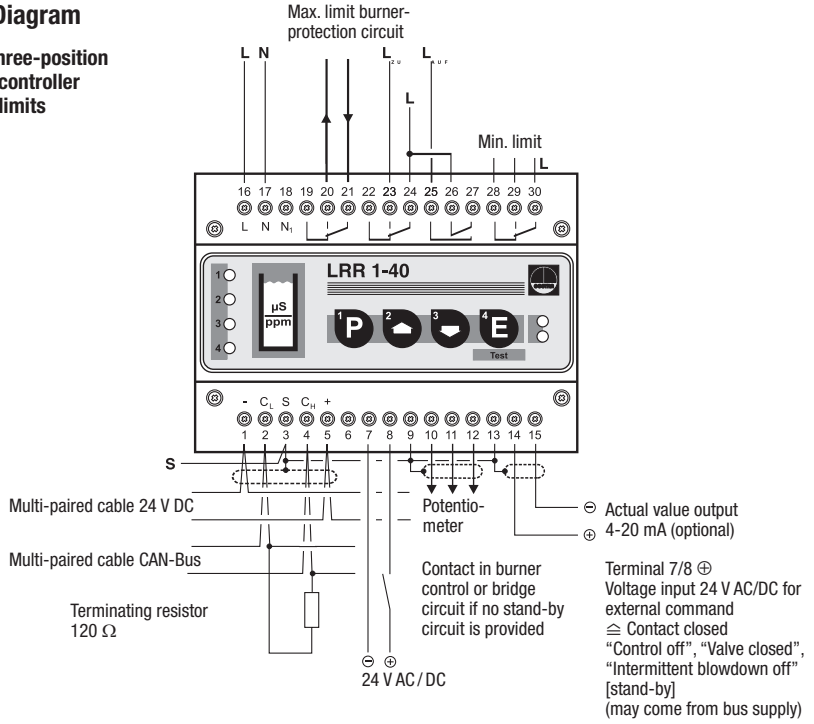
Supply in accordance with our general terms of business.

Dimensions

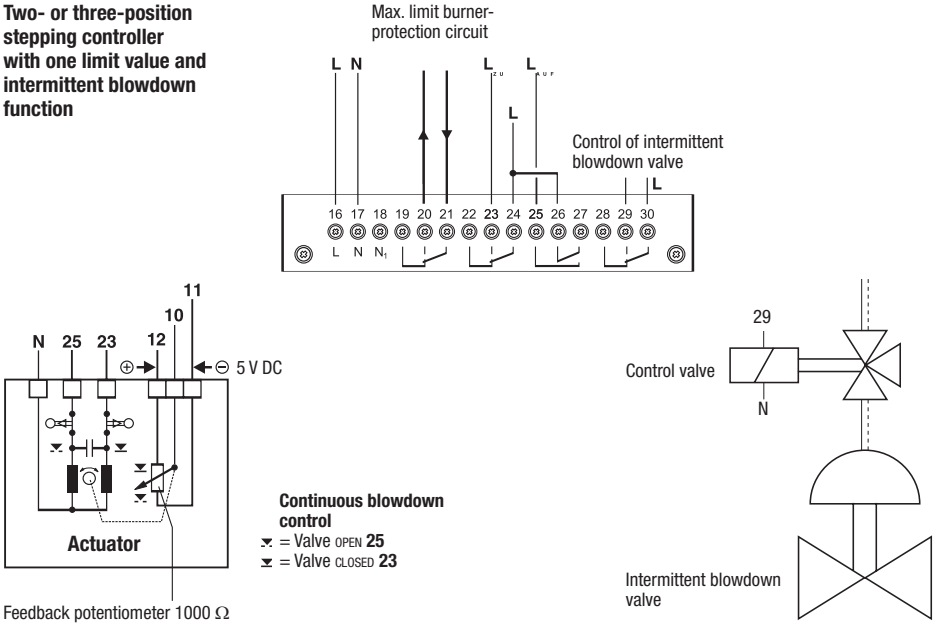


Wiring Diagram

Two- or three-position stepping controller with two limits



Two- or three-position stepping controller with one limit value and intermittent blowdown function



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