

LRS 1-50

Conductivity Switch LRS 1-50

Description

The LRS 1-50 conductivity switch is used in combination with LRG 1-... conductivity electrodes as a limit switch, e.g., in steam boilers and hot water installations or in condensate and feedwater tanks. The conductivity switch indicates when a MIN and MAX conductivity has been reached.

The LRS 1-50 conductivity switch can be combined in a circuit with the LRG 16-4 and LRG 16-9 conductivity electrodes.

Function

The LRS 1-50 conductivity switch, in conjunction with the LRG 16-... conductivity electrode, measures conductivity in conductive fluids. The conductivity electrode used is the LRG 16-4 conductivity electrode, or the LRG 16-9 with integrated resistance thermometer for monitoring the fluid temperature.

When the LRG 16-4 conductivity electrode is connected, a reference measurement is taken and a correction factor CF is adjusted to adapt the conductivity measurement to the specific conditions of the installation.

When the LRG 16-9 conductivity electrode is connected, the temperature of the water is measured as well as its conductivity. This enables the change in conductivity caused by rising water temperatures to be compensated and based on the standardized reference temperature of 77 °F (25 °C).

To do this, the temperature of the water is measured in the conductivity switch and the conductivity reading is automatically compensated as a function of the adjusted temperature coefficient tC (%/°C). If the temperature changes, thanks to linear temperature compensation the reading is referenced to 77 °F (25 °C) over the entire measuring range, and indicated as an actual value on the 7-segment LED display.

The MIN/MAX limits can be varied as desired within the measuring range.

If the MIN or MAX limit is reached, the MIN or MAX output contact switches and the MIN or MAX LED lights up. It switches back when the value is above or below the preset hysteresis.

Faults in the conductivity electrode or electrical connection and setting errors are shown on the 7-segment LED display. In the event of a malfunction, the MIN and MAX alarm is triggered.

If faults occur only in the LRS 1-50 conductivity switch, the MIN and MAX alarm is triggered and the system is restarted.

Parameters can be changed and the MIN/MAX alarm simulated by turning the rotary knob.

Electrical conductivity measurement is set to µS/cm as default. In some countries, ppm (parts per million) is used as well. Conversion 1 µS/cm = 0.5 ppm. You can set the conductivity switch to the required unit.

Technical data

Supply voltage

24 VDC, +/-20%; PELV / CLASS2

Fuse

External M0.5A (medium time-lag)

Power consumption

4 W

Connecting a conductivity electrode

1 input for LRG 16-4 conductivity electrode (cell constant 1 cm-1), 2-pole with shield,
1 input for LRG 16-9 conductivity electrode (cell constant 0.5 cm-1), with integrated resistance thermometer Pt100, 5-pole with shield.

Measuring voltage

0.8 Vss, pulse duty factor tv=0.5, frequency 20-10000 Hz.

Measuring range

1 to 10000 µS/cm at 77 °F (25 °C) or
1 to 5000 ppm at 77 °F (25 °C)

Correction factor CF

Adjustable from 0.05 to 5.000 in increments of 0.001

Temperature coefficient tC

0.0 – 3.0% per °C, adjustable in increments of 0.1

Reset hysteresis

MIN limit: + 3% of set MIN limit
MAX limit: - 3% of set MAX limit

Outputs

2 volt-free relay contacts,
8 A 250 V AC / 30 V DC cos φ = 1.

Inductive loads must have interference suppression (RC combination) as specified by the manufacturer.

Indicators and controls

1 rotary knob with integrated push-button for testing the MIN/MAX alarm and setting the parameters,
1 4-digit 7-segment LED display
2 red LEDs for MIN/MAX alarm,
1 4-pole code switch for configuration.

Terminal box

Terminal box material: base of black polycarbonate, front of gray polycarbonate.

Terminal strips can be removed separately.

Terminal box attachment: Mounting clip on support rail TH 35, EN 60715.

Electrical safety

Pollution degree 2, overvoltage category II according to UL 60730-1

Protection

Terminal box: IP 40 according to EN 60529

Terminal strip: IP 20 according to EN 60529

As a UL open type, the equipment must be installed in a control cabinet.

Weight

Approx. 0.44 lb (0.2 kg)

Ambient temperature

at power-on 32 ° ... 131 °F (0 ° ... 55 °C)
in operation 14 ° ... 131 °F (-10 ° ... 55 °C)

Transport temperature

-4 ° ... 176 °F (-20 ° ... +80 °C) (< 100 hours), only switch on after a defrosting period of 24 hours.

Storage temperature

-4 ° ... 158 °F (-20 ° ... +70 °C), only switch on after a defrosting period of 24 hours.

Relative humidity

Max. 95%, non-condensing

Conductivity Switch

LRS 1-50

Important notes

The LRS 1-50 conductivity switch is clipped onto a support rail in the control cabinet.

The equipment is supplied with 24 V DC (PELV / CLASS2) and has an external 0.5A medium time-lag fuse.

This power supply unit must provide a level of isolation against dangerous contact voltages that at least meets the requirements for double or reinforced insulation in accordance with the following standard: UL 60730-1.

Protect the output contacts with an external slow blow 2.5A fuse to prevent them from welding together.

Switching off inductive loads produces surges that can severely impair the function of control systems. Connected inductive loads must therefore have interference suppression (RC combination) as specified by the manufacturer.

Use a shielded, multi-core TC-ER control cable with minimum wire size AWG18 e.g., OELFLEX CONTROL TM CY 3G1, to connect the LRG 16-4 and LRG 16-9 conductivity electrode.

To connect the LRG 16-9 conductivity electrode, a pre-wired control cable in various lengths is available as an accessory.

This control cable is not UV-resistant and must be protected with a UV-resistant plastic tube or cable duct if installation is outdoors.

If you are not using the pre-wired control cable, lay a shielded TC-ER control cable with a minimum wire size of AWG18, e.g., OELFLEX CONTROL TM CY 5G1, as a connecting cable. In addition, connect a socket, e.g., Binder series 713 99-0436-58-05, to the control cable at the electrode end.

The cable length between the conductivity electrode and switch is max. 98 ft (30 m), or max. 32 ft (10 m) with a conductivity of 0.5 - 5 ppm (1-10 µS/cm).

Route connecting cables between items of equipment separately from power lines.

If used as a conductivity limiter, the LRS 1-50 conductivity switch does not interlock automatically when the MAX limit is exceeded.

If the installation requires an interlock, this must be implemented in the downstream (safety) circuit.

How to order and specify

Conductivity switch LRS 1-50

GESTRA SPECTOR_{modul}

Conductivity switch with MIN/MAX alarm

Input: 1 input for conductivity electrode

1 input for Pt100 sensor

Output: 2 volt-free relay contacts for MIN/MAX alarm

7-segment display

Measuring range switch-selectable from 0.25-5000 ppm (0.5-10,000 µS/cm)

Supply voltage: 24 V DC, 4 W

Please note our general terms of business.

Dimensions

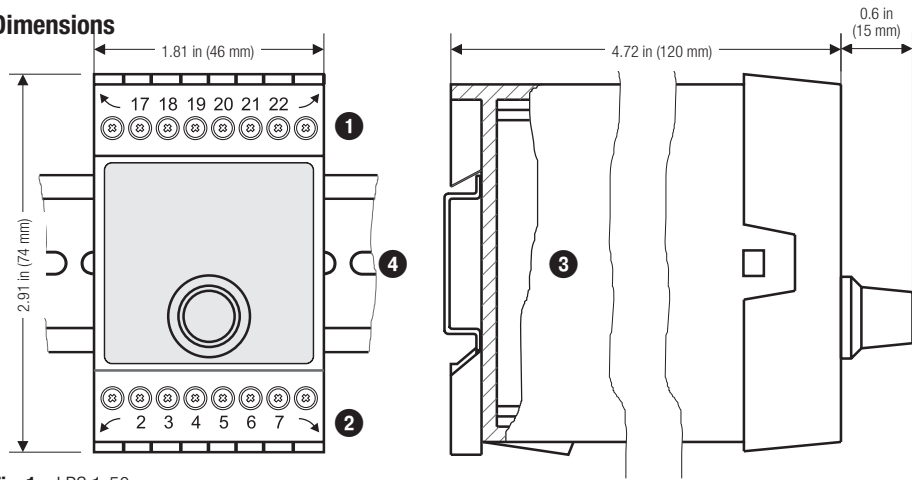


Fig. 1 LRS 1-50

Electrical connection of the LRS 1-50

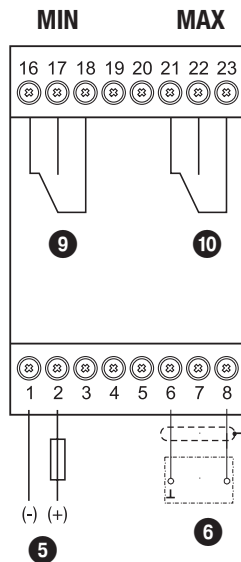


Fig. 2

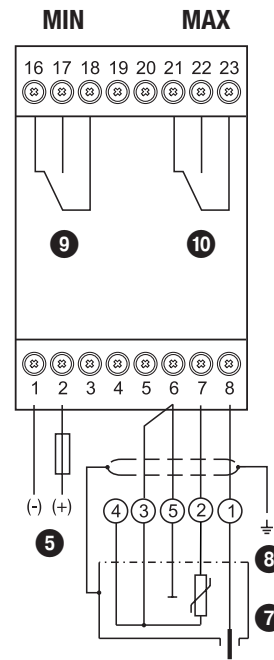


Fig. 3

Directives and standards

The equipment has been tested and approved for use in the scope governed by the following directives and standards:

Standards:

- UL 60730-1 and CAN/CSA E60730-1
General Requirements for Automatic Electrical Controls

Improper use

There is a danger of death due to explosion if the equipment is used in potentially explosive atmospheres.

Do not use the equipment in potentially explosive atmospheres.

Key

- 1 Upper terminal strip
- 2 Lower terminal strip
- 3 Terminal box
- 4 Support rail TH 35, EN 60715
- 5 Connection of supply voltage 24 V DC with 0.5A medium time-lag fuse provided by customer
- 6 Conductivity electrode LRG 1-..
- 7 Conductivity electrode LRG 16-9 with integrated resistance thermometer
- 8 Central grounding point (CGP) in control cabinet
- 9 MIN output contact
- 10 MAX output contact

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