The MC33-121Ex0-LRP is used to energise intrinsically safe 2-wire loop-type transmitters located in the hazardous area. The input and output circuits are isolated from each other and from the power supply.

- Intrinsically safe input circuit [EEx ia] IIC with static wire-break and short-circuit monitoring
- Power supply for 2-wire transmitters
- Current limiting within the transmitter loop
- Constant voltage on transmitter loop
- Galvanic isolation between input circuit, output circuit and power supply
- Simple calibration
- Programmable, 4 digit character display
- Voltage output 0...10 V and current output 0/4...20 mA
- One transistor and one relay output for status indication of setpoint 1 and 2
- Sealed relays with hard gold-plated contacts
- Interface for parameter programming via PC

The current signal output (0...20 mA) and the voltage signal output (0...10 V) may be used at the same time. During standard operation, the output signal corresponds to the input signal of 4...20 mA.

The intrinsically safe input circuit is statically monitored for wire-break and short-circuit condition. When faults in the input circuit occur, both setpoint outputs deactivate (relay contacts open, transistor not conducting).

Two relay outputs and two pnp short-circuit protected transistor outputs are available for setpoint indication. Both setpoints are independently adjustable. They are so designed that they can be used for either “overrange” or “under-range” monitoring.

The display indicates “err” (Error) and the green power LED changes to red. The current output during a malfunction in the input circuit (wire-break, short-circuit condition) can be programmed to automatically go either to 0 mA or ≥ 22 mA, or to follow the direction of the input signal (0 mA for wire-break, ≥ 22 mA for short-circuit condition).
Analogue Data Transmitters

All functions are programmed by two toggle switches on the front panel, or with personal computer (PC). The following parameters can be preselected:

- low value of analogue range
- high value of analogue range
- setpoint 1
- setpoint 2
- function of preset outputs
- switching hysteresis for both preset outputs from 1...20 %
- character display: as a percentage value, or as a numerical value from the adjustable range, or current in input circuit
- current output during a malfunction in input circuit (linear/0 mA/≥ 22 mA)

Programming

The four digit LED character display on the front of the device indicates the input signal. It can be displayed in one of three ways:

- as a percentage
- as a numerical parameter value
- current in input circuit (mA)

When the percentage is displayed, the preset levels are:

- low: 4 mA = 0 %
- high: 20 mA = 100 %

The input signal is displayed as a percentile value between 0 and 100 %.

To match the display to the application, the display is programmable in values from -999...+9999. The numerical value within this range is proportional to the input signal.

Example: Flow meter
Operating range 1...5 l/min = 4...20 mA:

To directly display the flow in l/m, 1 is used as status display for the low preset (4 mA) and 5 for the high preset (20 mA) of the predetermined values. A numerical value between 1 and 5 will therefore indicate the signal deviation between 4 and 20 mA.

### Type

<table>
<thead>
<tr>
<th>MC33-121Ex0-LRP/24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 405 00</td>
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</tbody>
</table>

### Power Supply

<table>
<thead>
<tr>
<th>U_M</th>
<th>Ripple Wpp</th>
<th>Overvoltage release</th>
<th>Power/Current consumption</th>
<th>Galvanic isolation</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.4...27.6 VDC</td>
<td>≤ 10 %</td>
<td>33 V ± 1.5 V</td>
<td>≤ 200 mA</td>
<td>between input circuit, output circuit and supply voltage for 250 Vrms, test voltage 2.5 kVrms</td>
</tr>
</tbody>
</table>

### Transducer Circuit

Input resistance 50 Ω

Operating characteristics

- Voltage: 15.2 V constant
- Current: 4...20 mA
- Wire-break threshold: ≤ 2 mA
- Short-circuit threshold: ≥ 22 mA
- Short-circuit current limitation: 25 mA ± 1 mA

### Output Circuits

- Current output: 0/4...20 mA (load ≤ 600 Ω)
- Voltage output: 0...10 V (R < 2 kΩ)
- Setpoint control/alarm output:
  - Transistor output: 1 transistor and 1 relay output each
  - Relay output: 1 potential-free SPDT contact
  - Switching voltage: ≤ 250 V
  - Switching current: ≤ 2 A
- Contact material: silver-alloy + 3 µm Au

### Interface

- RS232 serial/V.24 via adapter MC-IM-232

### Ex-Approval acc. to Certification of Conformity

Input circuit

- Maximum nominal values:
  - Maximum load voltage U_M:
    - 18.9 V (R_C = 511 Ω)
  - Maximum external inductances/capacitances:
    - [Ex ia] IIC: 1 mH/68 nF
    - [Ex ia] IIB: 1 mH/480 nF

### Transfer Characteristics

Measuring range: 4...20 mA

- Linearity tolerance: ≤ 0.1 % of final value (typically 0.03 %)
- Effect of load impedance: ≤ 0.01 % of final value
- Effect of supply voltage: negligible
- Ambient temperature sensitivity: ≤ 0.005 % / K of final value

### LED Indication

- Power "ON" (2-colour LED)
- Limit values (2-colour LED)
- Pulse range programming
- Card parameter programming
- Readout in %/var/mA

- Display: green: power "ON" - red: fault
- green: program. mode - yellow: at preset value
- green
- red
- red (4 digits)

### Eurocard

100 x 160 mm (DIN 41494)

Connector per DIN 41612, type F, 32-pole (series z+d)