Thermoelement Measuring Amplifier
MC34-41B, 4 channels

- Intrinsically safe input circuits [EEx ia] IIC
- Inputs for thermoelements, type J or E in hazardous areas
- Input circuits galvanically isolated from each other, from power supply and from bus
- Optional reference point compensation
- Temperature measuring range
  - Type E: 0...+1200 °C
  - Type J: 0...+1000 °C
- Resolution 0.5 K
- One LED per channel for alarm indications
- Wire-break detection

The MC34-41B enables operation of four thermocouples (type J or E) in hazardous areas. The thermocouple voltage is converted into a temperature value according to IEC 584 and transferred with a signal resolution of 0.5 K. Temperatures from 0°C to the measuring range end value of the thermocouple are measured (per IEC 584).

Comparison and compensation take place internally. For this, the thermocouple lines must be connected to the respective rack sockets.

The input lines are monitored for wire-break by means of a constant current. This results in a temperature measuring error of 0.2 K per 100 Ω line resistance.

Unused channels should be short-circuited via a jumper to suppress error indications within the diagnosis telegram.

The input circuits are galvanically isolated from each other and from the power supply.

Each input circuit is monitored by an error indication LED:
- off: thermocouple connected
- red: wire-break

This device requires 8 bytes of the master’s memory.
sensoplex® MC

The dual colour „Status“ LED indicates the module’s status:

- green: supply voltage is present, the module is operating
- green flashing: initialisation of link to the master; constant green flashing: connection cannot be established
- red flashing: wrongly inserted module
- off: hardware error, the module is not operating

The internal reference point is located close to the terminal strip of the module. Insufficient ventilation of the module rack may lead to an internal temperature accumulation and the reference point may display a higher temperature than the connected thermocouple lines. This results in a temperature measurement error.

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- 15 VDC (system power supply)
- ≤ 200 mA
- input circuits isolated from each other (30 V_{rms}), from bus and from supply up to 250 V_{rms}, test voltage 2.5 kV_{rms}

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- intrinsically safe (per EN 50020)
- type J or type E
- internally adjustable

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- 7.2 V
- 14.6 mA
- 155 mH/13.5 µF
- 560 mH/240 µF

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- 0...+1200 °C
- 0...+1000 °C
- 0.5 K
- ≤ 1 K
- ≤ 50 ppm
- ± 2 K (in module rack)
- approx. 0.2 K/100 Ω

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- green/red (dual colour LED)
- 4 red LEDs

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- Epoxy resin, glass fibre reinforced, quality class FR4
- plastic, 4TE = 20.32 mm
- sensoplex® MC rack assembly
- 0 ... 50 °C

**The dual colour „Status“ LED indicates the module’s status:**

- **green:** supply voltage is present, the module is operating
- **green flashing:** initialisation of link to the master; constant green flashing: connection cannot be established
- **red flashing:** wrongly inserted module
- **off:** hardware error, the module is not operating

**The internal reference point is located close to the terminal strip of the module. Insufficient ventilation of the module rack may lead to an internal temperature accumulation and the reference point may display a higher temperature than the connected thermocouple lines. This results in a temperature measurement error.**
The MC34-42B enables operation of four thermocouples (type K) in hazardous areas. The thermocouple voltage is converted into a temperature value according to IEC 584 and transferred with a signal resolution of 0.5 K. Temperatures from 0°C to the measuring range end value of the thermocouple are measured (per IEC 584).

Comparison and compensation take place internally. For this, the thermocouple lines must be connected to the respective rack sockets.

The input lines are monitored for wire-break by means of a constant current. This results in a temperature measuring error of 0.2 K per 100 Ω line resistance.

Unused channels should be short-circuited via a jumper to suppress error indications within the diagnosis telegram.

The input circuits are galvanically isolated from each other and from the power supply.

Each input circuit is monitored by an error indication LED:
- off: thermocouple connected
- red: wire-break

This device requires 8 bytes of the master’s memory.
Fieldbus Components

The dual colour „Status“ LED indicates the module’s status:

- green: supply voltage is present, the module is operating
- green flashing: initialisation of link to the master; constant green flashing: connection cannot be established
- red flashing: wrongly inserted module, hardware error, the module is not operating
- off:

The internal reference point is located close to the terminal strip of the module. Insufficient ventilation of the module rack may lead to an internal temperature accumulation and the reference point may display a higher temperature than the connected thermocouple lines. This results in a temperature measurement error.

| Type          | MC34-42B  
|---------------|-----------
| Ident-No.     | 90 301 21 |

**Operating voltage** $U_B$
- Current consumption $\leq 200 \text{ mA}$
- Galvanic isolation
  - input circuits isolated from each other ($30 \text{ rms}$)
  - from bus and from supply up to $250 \text{ V}_{\text{rms}}$
  - test voltage $2.5 \text{ kV}_{\text{rms}}$

**Input circuits**
- Thermoelements
- Intrinsically safe (per EN 50020)
- Type K
- Reference point compensation
  - internally adjustable

**Ex-Approvals acc. to Certificate of Conformity**

- TÜV 98 ATEX 1280 X

**Input circuit Maximum values**
- No-load voltage $U_0$
  - $7.2 \text{ V}$
- Short-circuit current $I_0$
  - $14.6 \text{ mA}$
- External inductances/capacitances
  - $[\text{EEEx ia}] \text{ IIC}$
    - $155 \text{ mH}/13.5 \text{ µF}$
  - $[\text{EEEx ia}] \text{ IIB}$
    - $560 \text{ mH}/240 \text{ µF}$

**Transmission characteristics**

- Measuring range
  - Thermoelement type K
    - $0...+1372 \text{ °C}$
- Temperature resolution
  - $0.5 \text{ K}$
- Linearity error
  - $\leq 1 \text{ K}$
- Temperature drift
  - $\leq 50 \text{ ppm}$
- Measuring accuracy of reference point
  - ± $2 \text{ K}$ (in module rack)
- Temperature measuring error due to line resistance
  - approx. $0.2 \text{ K}/100 \Omega$

**LED indications**
- Power “on”/bus error: green/red (dual colour LED)
- Channel error: 4 red LEDs

**Eurocard module**

- Base material:
  - Epoxy resin, glass fibre reinforced, quality class FR4
- Front panel:
  - Plastic, 4TE = 20.32 mm for individual interlocking
- Connection:
  - Sensoplex® MC rack assembly
- Operating temperature
  - $0...50 \text{ °C}$

**Coding (No. 813)**

The dual colour „Status“ LED indicates the module’s status:

- green: supply voltage is present, the module is operating
- green flashing: initialisation of link to the master; constant green flashing: connection cannot be established
- red flashing: wrongly inserted module, hardware error, the module is not operating
- off: