

# AXL F UTH4 1H - Temperature module



2688598

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Axioline F, Temperature recording module, Analog inputs: 4 (4 inputs for thermocouples or linear voltage, plus 1 input -5 V to +5 V), connection technology: 2-conductor (shielded, twisted pair), transmission speed in the local bus: 100 Mbps, degree of protection: IP20, including bus base module and Axioline F connectors

## Product description

The module is designed for use within an Axioline F station. It is used to acquire signals from standard thermocouples in industrial applications. The module supports various types of thermocouple conforming to DIN EN 60584-1 and DIN 46710 as well as linear voltages from -100 mV to +100 mV. It also offers a voltage input from -5 V to +5 V. Heating currents can be monitored here, for example, using a measuring transducer. Both Pt 100 inputs (CJ1 and CJ2) can each be used as a sensor input or as an external cold junction.

## Your advantages

- 4 analog input channels to connect thermocouples or linear voltages from -100 mV to +100 mV
- 1 analog input channel for the connection of voltages from -5 V to +5 V
- Connection of sensors in 2-conductor technology
- Internal detection and compensation of cold junction temperature (can be parameterized)
- External connection of Pt 100 cold junction sensors possible
- Low tolerances (typically  $\pm 0.01\%$  for sensor type K)
- Very low measuring tolerances, even in various mounting positions, due to built-in space compensation of the internal cold junction
- High temperature stability (typically 8 ppm/K)
- High resistance to electromagnetic interference (Class A)
- "Channel Scout" function
- Device rating plate stored
- Installation monitoring with indication via diagnostic LED for each channel

## Commercial data

|                                      |               |
|--------------------------------------|---------------|
| Item number                          | 2688598       |
| Packing unit                         | 1 pc          |
| Minimum order quantity               | 1 pc          |
| Sales key                            | DR02          |
| Product key                          | DRI243        |
| GTIN                                 | 4046356780117 |
| Weight per piece (including packing) | 194.2 g       |
| Weight per piece (excluding packing) | 144 g         |
| Customs tariff number                | 85389091      |
| Country of origin                    | DE            |

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## Technical data

### Dimensions

|                     |  |
|---------------------|--|
| Dimensional drawing |  |
| Width               | 35 mm  |
| Height              | 126.1 mm   |
| Depth               | 54 mm  |
| Note on dimensions  | The depth applies when a TH 35-7.5 DIN rail is used (in accordance with EN 60715). |

### Notes

#### Note on application

|                     |                         |
|---------------------|-------------------------|
| Note on application | Only for industrial use |
|---------------------|-------------------------|

### Material specifications

|                 |                 |
|-----------------|-----------------|
| Color (Housing) | gray (RAL 7042) |
|-----------------|-----------------|

### Interfaces

#### Axioline F local bus

|                      |                 |
|----------------------|-----------------|
| Number of interfaces | 2               |
| Connection method    | Bus base module |
| Transmission speed   | 100 Mbps        |

### System properties

#### Programming data (LocalbusSlave)

|                     |         |
|---------------------|---------|
| Input address area  | 10 Byte |
| Output address area | 10 Byte |

#### Fieldbus data telegram

|                             |         |
|-----------------------------|---------|
| Required parameter data     | 12 Byte |
| Required configuration data | 7 Byte  |

### Input data

#### Analog:

|                          |  |
|--------------------------|--|
| Input name               | Analog inputs                              |
| Description of the input | Inputs for thermocouples or linear voltage |

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|                                     |   |
|-------------------------------------|---|
| Number of inputs                    | 4 + 1 (4 inputs for thermocouples or linear voltage, plus 1 input - 5 V to +5 V)                        |
| Connection method                   | Push-in connection  |
| Connection technology               | 2-conductor (shielded, twisted pair)  |
| A/D converter resolution            | 24 bit  |
| Sensor types (RTD) that can be used | Pt 100 (2 external cold junctions, can also be used as a sensor input)                                  |
| Sensor types that can be used (TC)  | U, T, L, J, E, K, N, S, R, B, C, W, HK  |
| Tolerance, relative                 | typ. 0.01 % (Thermocouple type K, NiCr-Ni)<br>see tables for tolerance values                           |
| Tolerance, absolute                 | typ. ± 0.19 K (Thermocouple type K, plus tolerance of cold junction)<br>see tables for tolerance values |
| Measuring principle                 | Sigma/Delta process   |
| Measured value representation       | 16 bits (15 bits + sign bit)  |
| Input filter time                   | 40 ms<br>60 ms<br>100 ms<br>120 ms (adjustable)   |
| Protective circuit                  | Short-circuit protection, overload protection of the inputs<br>Transient protection of inputs           |

## Product properties

|                   |   |
|-------------------|---|
| Product type      | I/O component   |
| Product family    | Axioline F  |
| Type              | block modular   |
| Mounting position | any (no temperature derating; Parameterize the mounting position using the object 0080 <sub>hex</sub> ParaTable!) |
| Scope of supply   | including bus base module and Axioline F connectors   |

## Insulation characteristics

|                      |                              |
|----------------------|------------------------------|
| Overvoltage category | II (IEC 60664-1, EN 60664-1) |
| Pollution degree     | 2 (IEC 60664-1, EN 60664-1)  |

## Electrical properties

|   |        |
|---|--------|
| Maximum power dissipation for nominal condition | 1.75 W |
|---|--------|

### Potentials: Axioline F local bus supply ( $U_{BUS}$ )

|                |                              |
|----------------|------------------------------|
| Supply voltage | 5 V DC (via bus base module) |
| Current draw   | max. 160 mA<br>typ. 112 mA   |

### Potentials: Supply for analog modules ( $U_A$ )

|                      |  |
|----------------------|--|
| Supply voltage       | 24 V DC  |
| Supply voltage range | 19.2 V DC ... 30 V DC (including all tolerances, including ripple) |
| Current draw         | max. 40 mA<br>typ. 23 mA   |

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|  |  |
|--|--|
| Protective circuit   | Surge protection; electronic (35 V, 0.5 s)             |
|  | Reverse polarity protection; Polarity protection diode |
|  | Transient protection; Suppressor diode                 |
| Electrical isolation/isolation of the voltage ranges                         |  |
| Test voltage: 5 V supply of the local bus ( $U_{BUS}$ ) / 24 V supply (I/Os) | 500 V AC, 50 Hz, 1 min                                 |
| Test voltage: 5 V supply of the local bus ( $U_{BUS}$ ) / functional ground  | 500 V AC, 50 Hz, 1 min                                 |
| Test voltage: 24 V supply (I/O) / functional ground                          | 500 V AC, 50 Hz, 1 min                                 |

## Connection data

### Connection technology

|                               |   |
|-------------------------------|---|
| Connection name               | Axioline F connector  |
| Note on the connection method | Please observe the information provided on conductor cross-sections in the "Axioline F: system and installation" user manual. |

### Axioline F connector

|                                   |   |
|-----------------------------------|---|
| Connection method                 | Push-in connection  |
| Note on the connection method     | Please observe the information provided on conductor cross-sections in the "Axioline F: system and installation" user manual. |
| Conductor cross-section, rigid    | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section, flexible | 0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>   |
| Conductor cross-section AWG       | 24 ... 16   |
| Stripping length                  | 8 mm  |

## Environmental and real-life conditions

### Ambient conditions

|  |   |
|--|---|
| Ambient temperature (operation)          | -25 °C ... 60 °C                                  |
| Degree of protection                     | IP20  |
| Air pressure (operation)                 | 70 kPa ... 106 kPa (up to 3000 m above sea level) |
| Air pressure (storage/transport)         | 70 kPa ... 106 kPa (up to 3000 m above sea level) |
| Ambient temperature (storage/transport)  | -40 °C ... 85 °C                                  |
| Permissible humidity (operation)         | 5 % ... 95 % (non-condensing)                     |
| Permissible humidity (storage/transport) | 5 % ... 95 % (non-condensing)                     |

### Mechanical test

|  |     |
|--|-----|
| Vibration resistance in accordance with EN 60068-2-6/IEC 60068-2-6 | 5g  |
| Shock in accordance with EN 60068-2-27/IEC 60068-2-27              | 30g |
| Continuous shock in accordance with EN 60068-2-27/IEC 60068-2-27   | 10g |

## Standards and regulations

|                  |                                       |
|------------------|---------------------------------------|
| Protection class | III (IEC 61140, EN 61140, VDE 0140-1) |
|------------------|---------------------------------------|

## Mounting

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|                   |   |
|-------------------|---|
| Mounting type     | DIN rail mounting   |
| Mounting position | any (no temperature derating; Parameterize the mounting position using the object 0080 <sub>hex</sub> ParaTable!) |

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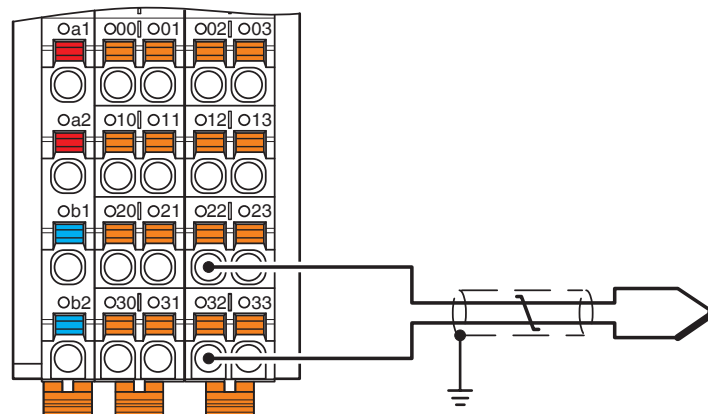
## Drawings

Dimensional drawing



Dimensions (in mm)

Connection diagram



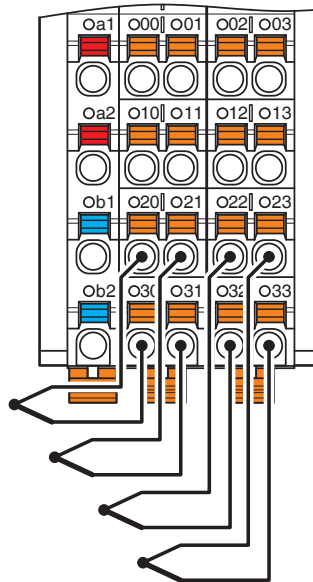
Connection example

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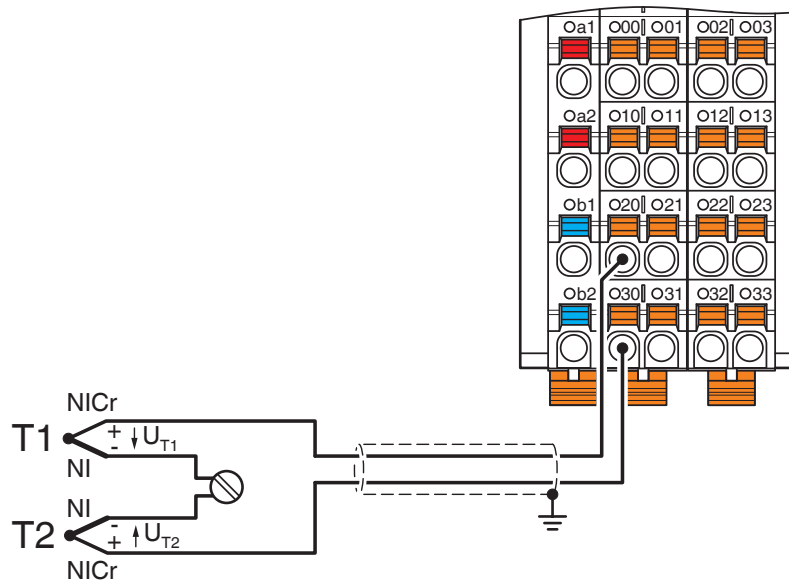
<https://www.phoenixcontact.com/us/products/2688598>

Connection diagram



Connection example: absolute temperature measurement

Connection diagram



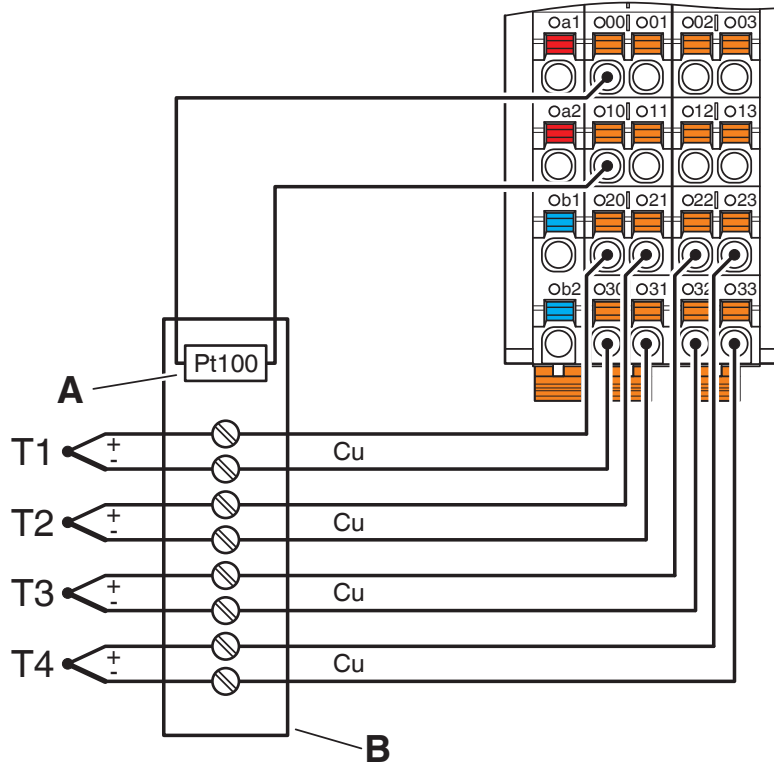
Differential temperature measurement

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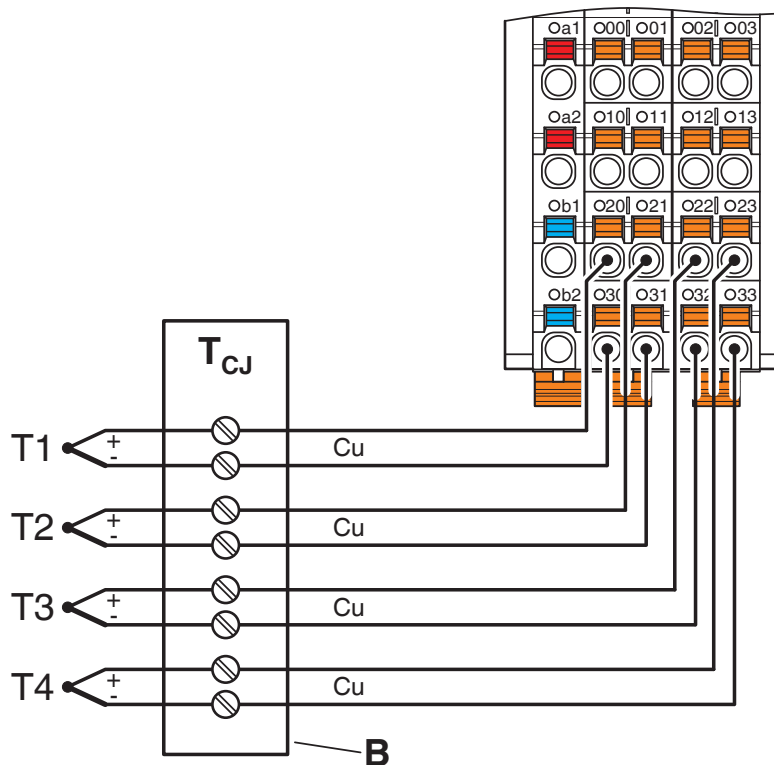
<https://www.phoenixcontact.com/us/products/2688598>

Connection diagram



Thermocouple detection with external cold junction compensation at channel 1

Connection diagram



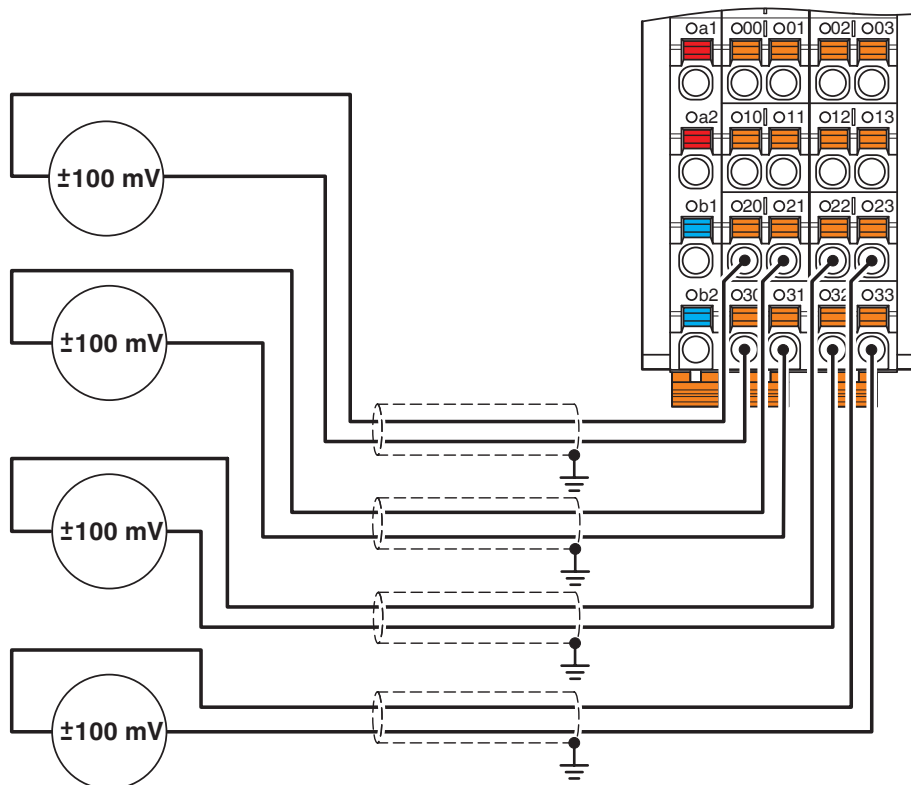
Thermocouple detection with cold junction temperature specification via process data

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Connection diagram



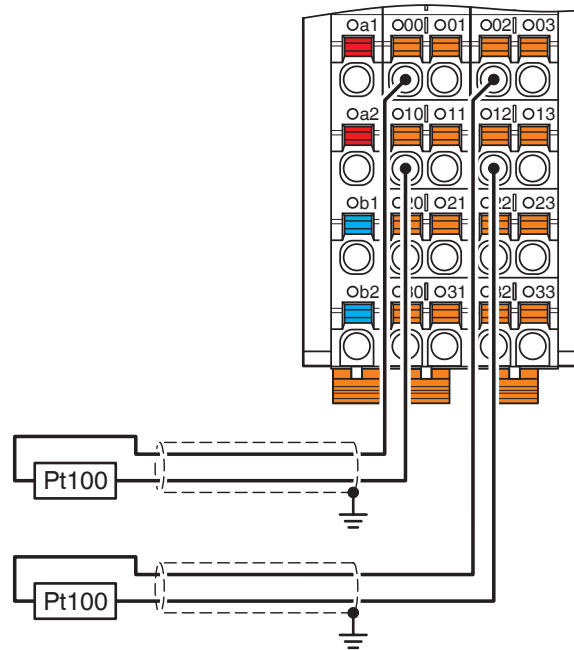
Measurement of linear voltages  $\pm 100 \text{ mV}$

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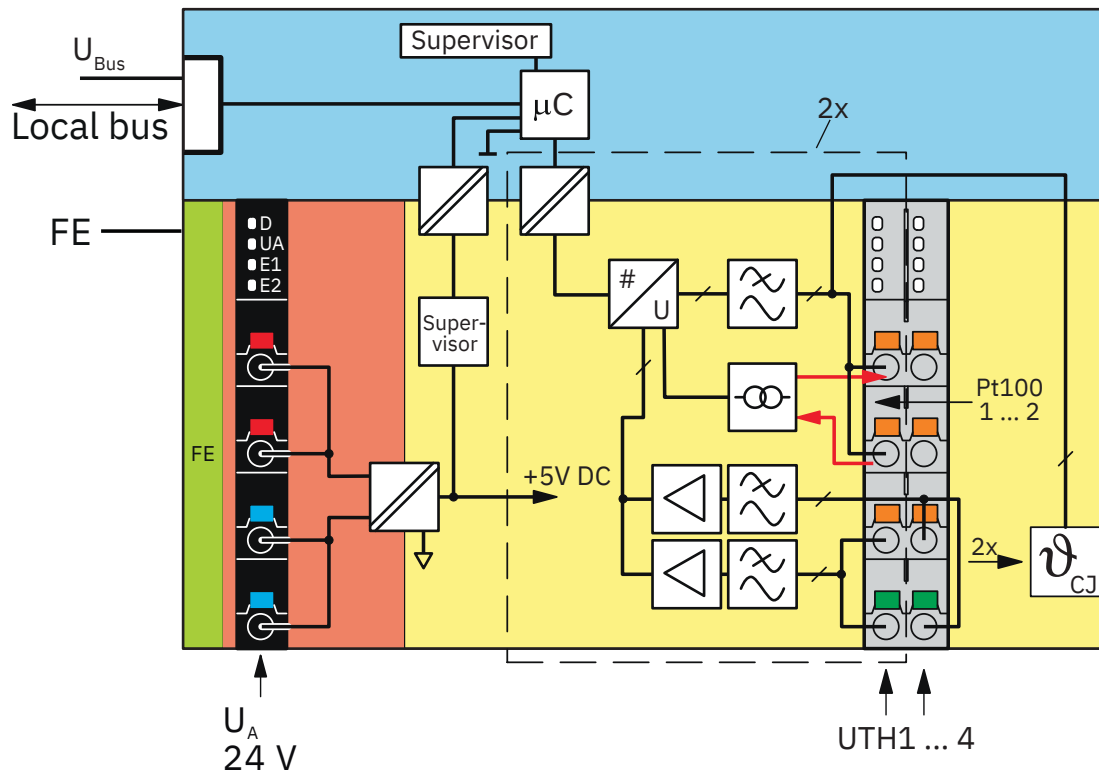
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Connection diagram



Pt 100 detection

Block diagram



Internal wiring of the terminal points

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2688598>



**DNV GL**

Approval ID: TAA00000DF



**LR**

Approval ID: LR2480202TA-02



**PRS**

Approval ID: TE/1020/880590/21

**BSH**

Approval ID: 840



**RINA**

Approval ID: ELE008423XG001

**ABS**

Approval ID: 23-2449604-PDA



**cULus Listed**

Approval ID: E238705

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## Classifications

### ECLASS

|             |          |
|-------------|----------|
| ECLASS-13.0 | 27242601 |
| ECLASS-15.0 | 27242601 |

### ETIM

|           |          |
|-----------|----------|
| ETIM 10.0 | EC001596 |
|-----------|----------|

### UNSPSC

|             |          |
|-------------|----------|
| UNSPSC 21.0 | 32151600 |
|-------------|----------|

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## Environmental product compliance

### EU RoHS

|   |              |
|---|--------------|
| Fulfills EU RoHS substance requirements | Yes          |
| Exemption                               | 7(a), 7(c)-I |

### China RoHS

|  |   |
|--|---|
| Environment friendly use period (EFUP) | EFUP-50   |
|  | An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required. |

### EU REACH SVHC

|                                     |   |
|-------------------------------------|---|
| REACH candidate substance (CAS No.) | Lead(CAS: 7439-92-1)  |
|                                     | 6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol(CAS: 119-47-1) |
| SCIP                                | a5ee3d70-01ec-429f-9e3a-fb4b5e9ba999                        |

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