

AXL F RTD8 XC 1F - Temperature module

2701235

<https://www.phoenixcontact.com/us/products/2701235>

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The figure shows the standard item

Axioline F, Temperature recording module, Analog inputs: 8 (for resistance temperature detectors), connection technology: 2-, 3-, 4-conductor (shielded), transmission speed in the local bus: 100 Mbps, Extreme conditions version, 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 resistive temperature sensors. The module supports all common platinum and nickel sensors in accordance with DIN EN 60751 and SAMA. Cu10, Cu50, Cu53 sensors as well as various KTY8x sensor types are also supported.

Your advantages

- 8 analog input channels for the connection of resistance temperature detectors (RTD)
- 500 Ω and 5 k Ω linear inputs
- Connection of sensors in 2-, 3-, and 4-conductor technology
- Integrated, digital sensor linearization
- Standardized measured value representation directly in $^{\circ}\text{C}$, $^{\circ}\text{F}$ or Ω
- Measured value display in 16-bit format or floating point format
- Programmable filters
- Short-circuit protected inputs
- Temperature stability
- Very high level of noise immunity
- Low noise emission
- Installation monitoring by means of "Channel scout" function
- Can be used under extreme ambient conditions
- Extended temperature range of $-40\text{ }^{\circ}\text{C}$... $+70\text{ }^{\circ}\text{C}$ (see "Tested successfully: use under extreme ambient conditions" in the data sheet)
- Partially coated PCBs
- Device rating plate stored

Commercial data

| | |
|------------------------|---------------|
| Item number | 2701235 |
| Packing unit | 1 pc |
| Minimum order quantity | 1 pc |
| Sales key | DR02 |
| Product key | DRI243 |
| GTIN | 4046356730471 |

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| | |
|--------------------------------------|----------|
| Weight per piece (including packing) | 245.3 g |
| Weight per piece (excluding packing) | 216.51 g |
| Customs tariff number | 85389091 |
| Country of origin | DE |

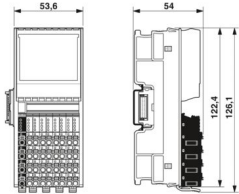
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Technical data

Dimensions

| | |
|---------------------|------------------------------------------------------------------------------------|
| Dimensional drawing |  |
| Width | 53.6 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 | 16 Byte |
| Output address area | 0 Byte |

Fieldbus data telegram (PROFIBUS)

| | |
|-----------------------------|---------|
| Required parameter data | 20 Byte |
| Required configuration data | 6 Byte |

Input data

Analog:

| | |
|--------------------------|------------------------------------------|
| Input name | Analog inputs |
| Description of the input | Inputs for resistive temperature sensors |
| Number of inputs | 8 (for resistance temperature detectors) |

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| | |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connection method | Push-in connection |
| Connection technology | 2-, 3-, 4-conductor (shielded) |
| A/D converter resolution | 24 bit |
| Sensor types (RTD) that can be used | Pt, Ni, KTY, Cu sensors |
| Tolerance, relative | see tables for tolerance values |
| Tolerance, absolute | typ. ± 0.1 K (Pt 100 with 3-wire connection) see tables for tolerance values |
| Data formats | IB IL, S7-compatible |
| Measured value representation | 16 bits (15 bits + sign bit) |
| Input filter time | 40 ms 60 ms 100 ms 120 ms (adjustable) |
| Nominal value of the current sources | 1 mA (Pt 100, Ni 100, R_{Lin} 500 Ω ; pulse current, the specification is valid during the sampling phase) 210 μ A (Pt 1000, Ni 1000, R_{Lin} 5000 Ω ; pulse current, the specification is valid during the sampling phase) |
| Differential non-linearity | typ. 1 ppm / ± 0.0001 % (in all ranges) |
| Integral non-linearity | typ. 30 ppm / ± 0.003 % (Pt 100) typ. 20 ppm / ± 0.002 % (R_{Lin} 500 Ω) typ. 200 ppm / ± 0.02 % (R_{Lin} 5000 Ω) |
| Linear resistance measuring range | 0 Ω ... 500 Ω 0 k Ω ... 5 k Ω |
| Protective circuit | Short-circuit protection, overload protection of the inputs Transient protection of inputs Transient protection of sensor supplies |

Product properties

| | |
|--------------------|-----------------------------------------------------|
| Product type | I/O component |
| Product family | Axioline F |
| Type | block modular |
| Mounting position | any (no temperature derating) |
| Scope of supply | including bus base module and Axioline F connectors |
| Special properties | Extreme conditions version |

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 | 1.5 W |
|-------------------------------------------------|-------|

Potentials: Axioline F local bus supply (U_{Bus})

| | |
|----------------|------------------------------------------------------|
| Supply voltage | 5 V DC (via bus base module) |
| Current draw | max. 180 mA (up to HW 01) max. 85 mA (from HW 02) |

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| | |
|--|---------------------------|
| | typ. 115 mA (up to HW 01) |
| | typ. 60 mA (from HW 02) |

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. 25 mA |
| | typ. 15 mA (up to HW 01) |
| | typ. 12 mA (from HW 02) |
| 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}) / analog inputs | 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) / analog inputs | 500 V AC, 50 Hz, 1 min |
| Test voltage: 24 V supply (I/O) / functional ground | 500 V AC, 50 Hz, 1 min |
| Test voltage: Analog inputs / 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 ² ... 1.5 mm ² |
| Conductor cross-section, flexible | 0.2 mm ² ... 1.5 mm ² |
| Conductor cross-section AWG | 24 ... 16 |
| Stripping length | 8 mm |

Environmental and real-life conditions

Ambient conditions

| | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Ambient temperature (operation) | -25 °C ... 60 °C (Standard) |
| | -40 °C ... 70 °C (Extended, see section "Tested successfully: use under extreme ambient conditions" in the data sheet.) |
| 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) |

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| | |
|------------------------------------------|-------------------------------|
| 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 |

Test (noxious gas)

| | |
|----------------------------------------------------------|-----------------------------------------------------------------|
| Test standard | ISA-71.04-2013 G3 Harsh Group A IEC 60068-2-60:2015 Method 4 |
| Temperature | 25 °C ±1 K |
| Humidity (relative) | 75 % ±3 % |
| Test duration | 21 Days |
| Volume concentration H ₂ S (Hydrogen sulfide) | 50 ppb |
| Volume concentration NO ₂ (Nitrogen dioxide) | 1250 ppb |
| Volume concentration Cl ₂ (Chlorine) | 10 ppb |
| Volume concentration SO ₂ (Sulfur dioxide) | 300 ppb |

Standards and regulations

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

Mounting

| | |
|-------------------|-------------------------------|
| Mounting type | DIN rail mounting |
| Mounting position | any (no temperature derating) |

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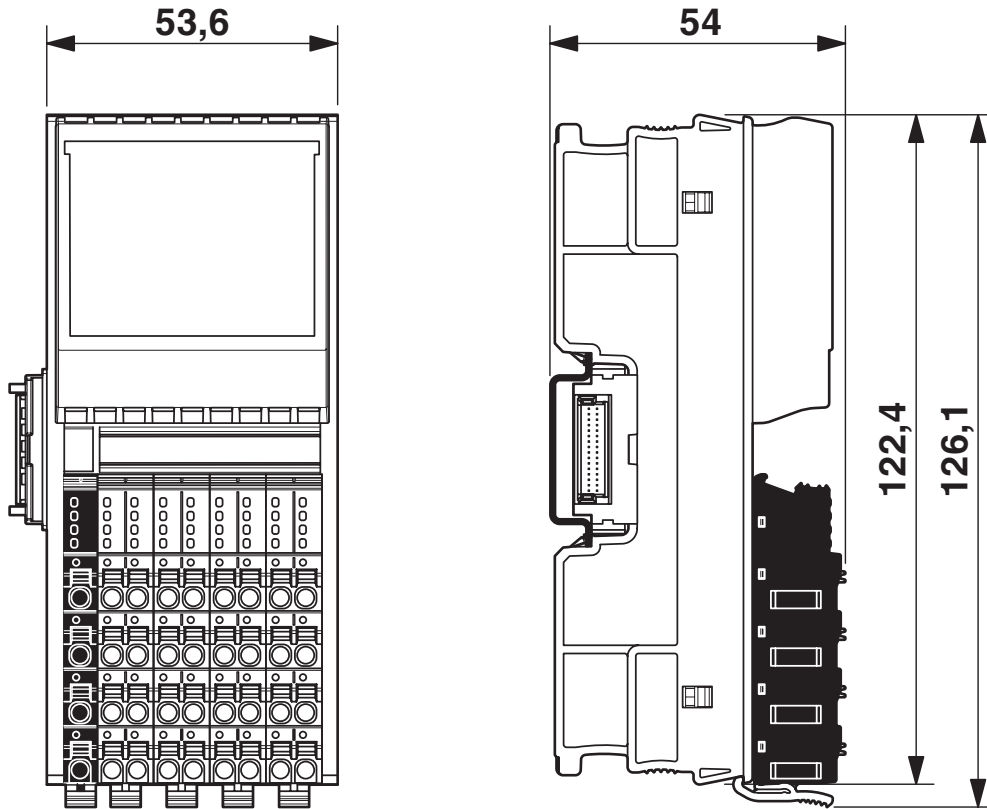


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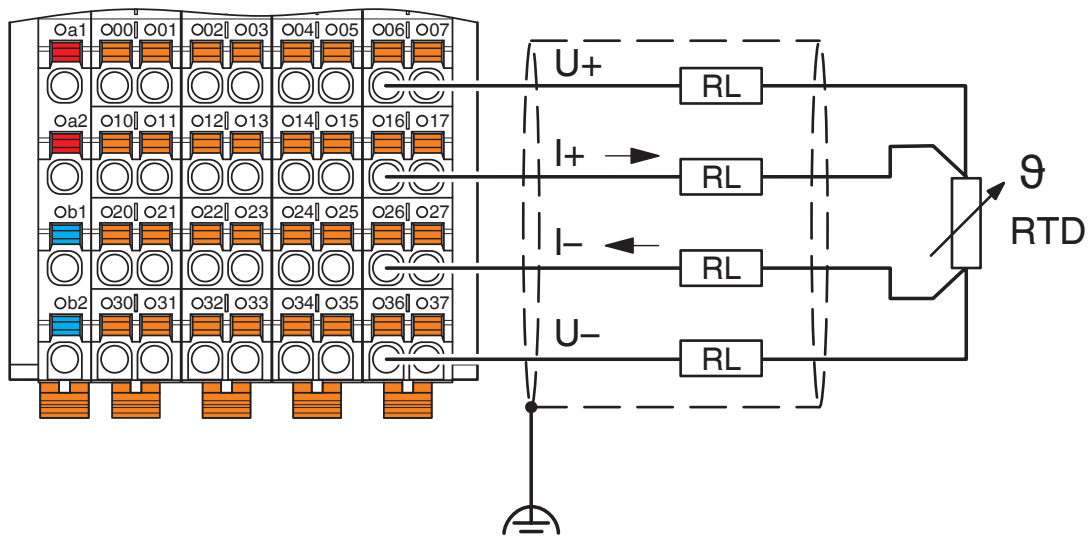
Drawings

Dimensional drawing



Dimensional drawing

Connection diagram



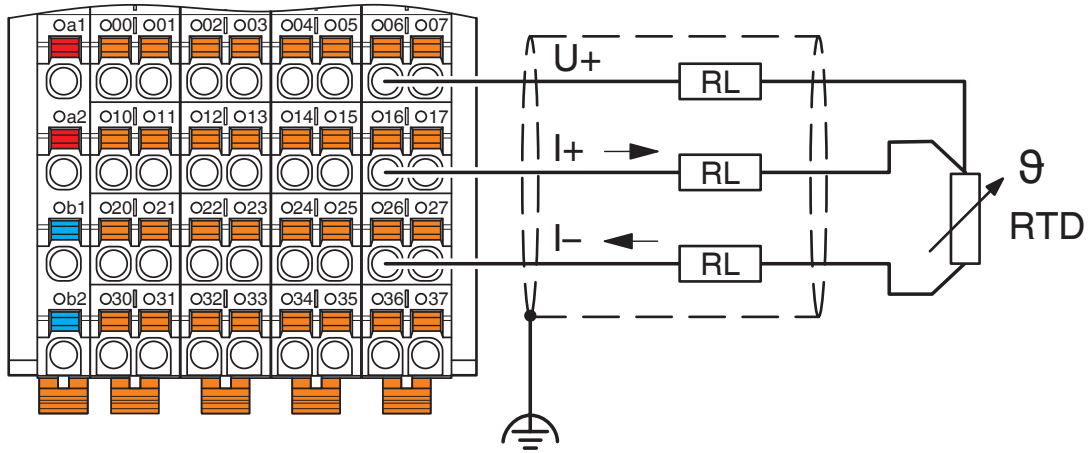
Connection example: 4-conductor connection

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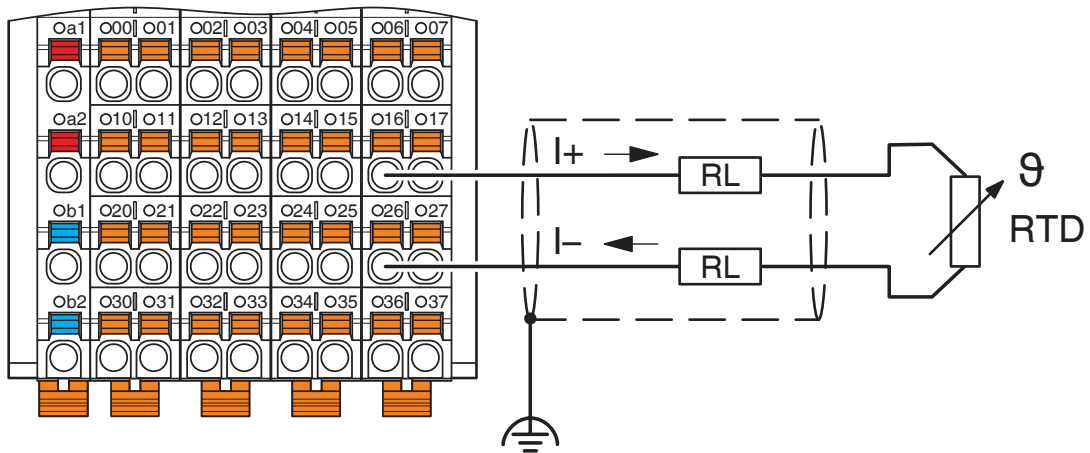
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Connection diagram



Connection example: 3-conductor connection

Connection diagram



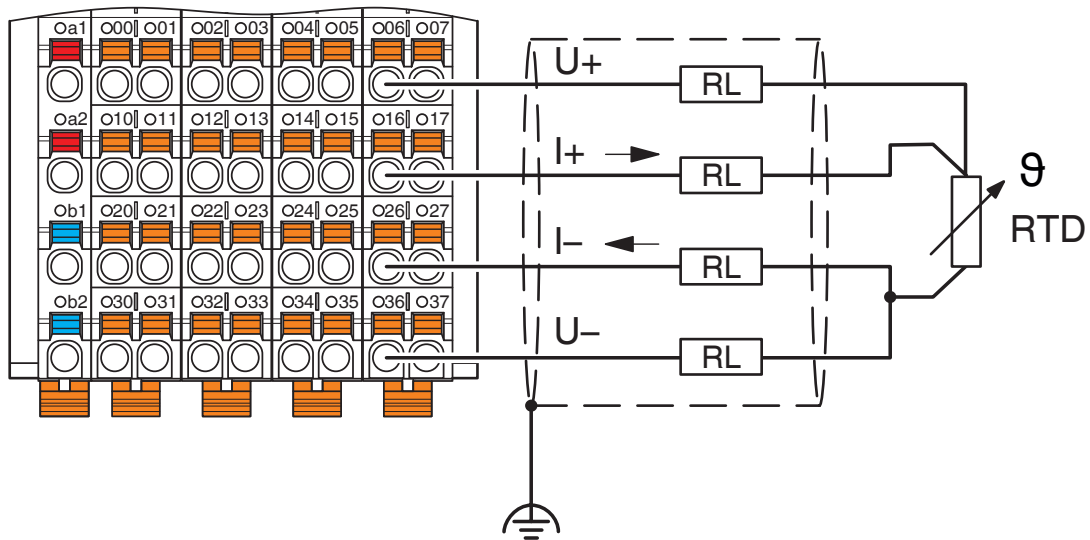
Connection example: 2-conductor connection

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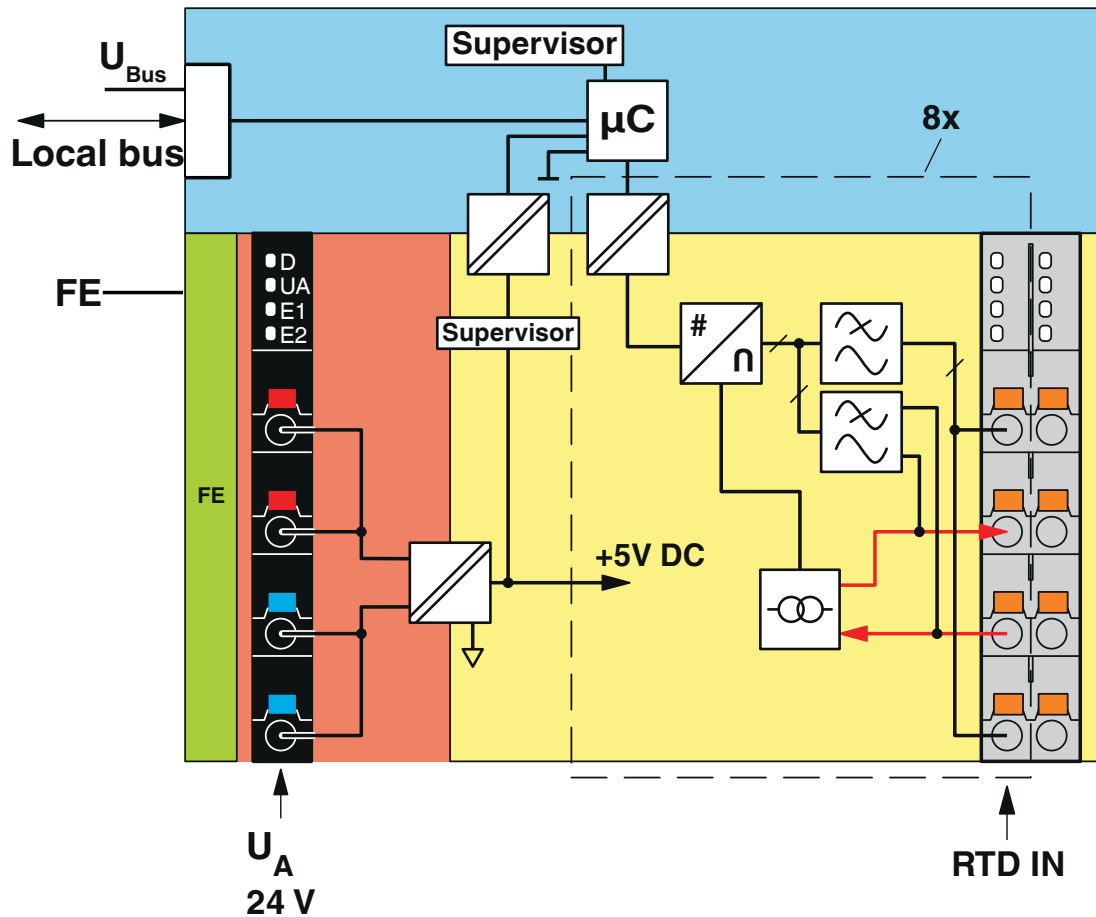
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Connection diagram



Connection example: 4-conductor connection for 3-conductor sensor with very long supply lines (> 100 m)

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/2701235>



DNV GL

Approval ID: TAA00000DF



PRS

Approval ID: TE/1020/880590/21

BSH

Approval ID: 840



RINA

Approval ID: ELE008423XG001



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 | f02a9f89-486c-4b8f-b95b-9842a918104b |

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