

# AXL F UTH8 XC 1F - Temperature module



2702464

<https://www.phoenixcontact.com/us/products/2702464>

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Axioline F, Temperature recording module, Analog inputs: 8 (8 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, 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 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. The four Pt 100 inputs (CJ1 ... CJ4) can each be used as a sensor input or as an external cold junction.

## Your advantages

- 8 analog input channels for the connection of 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
- Easy to use due to internal linearization of the sensor characteristic curves
- Low tolerances (typically  $\pm 0.01\%$  for sensor type K)
- High temperature stability (typically 5 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
- Can be used under extreme ambient conditions
- Extended temperature range of -40 °C ... +70 °C (see "Tested successfully: use under extreme ambient conditions" in the data sheet)
- Partially coated PCBs

## Commercial data

Item number	2702464
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	DR02
Product key	DRI243
Catalog page	Page 87 (C-6-2019)
GTIN	4055626459264
Weight per piece (including packing)	293.8 g

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Weight per piece (excluding packing)	144 g
Customs tariff number	85389091
Country of origin	DE

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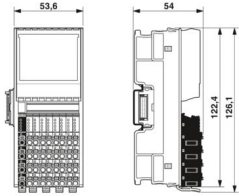


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## Technical data

### 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

### Interfaces

Axioline F local bus	
Number of interfaces	2
Connection method	Bus base module
Transmission speed	100 Mbps

### System properties

Module	
Input address area	18 Byte
Output address area	18 Byte
Required parameter data	27 Byte (20 bytes for configuration with GSD AXL UTH 8 (packed))
Required configuration data	7 Byte

### Input data

Analog	
Input name	Analog inputs
Description of the input	Inputs for thermocouples or linear voltage
Number of inputs	8 + 1 (8 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

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Sensor types (RTD) that can be used	Pt 100 (4 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
Measuring principle	Sigma/Delta process
Measured value representation	16 bits (15 bits + sign bit)
Input filter time	40 ms
	60 ms
	100 ms
	120 ms (adjustable)
Protective circuit	Short-circuit protection, overload protection of the inputs
	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 delivery	including bus base module and Axioline F connectors
Special properties	Extreme conditions version

## Data management status

Article revision	04
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## 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	2.6 W
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## Potentials

Power consumption	typ. 1.63 W (entire device)
	max. 2.58 W (entire device)

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

Supply voltage	5 V DC (via bus base module)
Current draw	max. 180 mA
	typ. 115 mA
Power consumption	max. 0.9 W
	typ. 0.55 W

## 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. 70 mA
	typ. 45.3 mA

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Power consumption	max. 1.68 W
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.

### Conductor connection

Connection method	Push-in connection
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

### 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 (Standard, applications with UL approval, use in zone 2 potentially explosive area)
	-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)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Permissible humidity (operation)	5 % ... 95 % (non-condensing)
Permissible humidity (storage/transport)	5 % ... 95 % (non-condensing)

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## Standards and regulations

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

### ATEX

Identification	Ⓜ II 3 G Ex ec IIC T4 Gc
Certificate	UL 20 ATEX 2441X
References to standards	EN IEC 60079-0, EN IEC 60079-7

### UKEX

Identification	Ⓜ II 3 G Ex ec IIC T4 Gc
Certificate	PxCIMA22UKEX2701949X
References to standards	EN IEC 60079-0, EN IEC 60079-7

### IECEX

Identification	Ex ec IIC T4 Gc
Certificate	IECEX ULD 20.0026X
References to standards	IEC 60079-0 Ed. 7, IEC 60079-7 Ed. 5.1

### UL, USA/Canada

Identification	cULus
Certificate	E238705

### UL Ex, USA / Canada

Identification	Class I, Zone 2, AEx ec IIC T4
	Class I, Division 2, Groups A, B, C, D, T4
	Ex ec IIC T4 Gc X
Certificate	E366272
References to standards	UL 60079-0 Ed. 7 / CSA C22.2 NO. 60079-0 Ed. 4
	UL 60079-7 Ed. 5 / CSA C22.2 NO. 60079-7 Ed. 2

### CCC / China-Ex

Identification	Ex ec IIC T4 Gc
Certificate	
References to standards	GB/T 3836.1-2021, GB/T 3836.3-2021

## Mounting

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

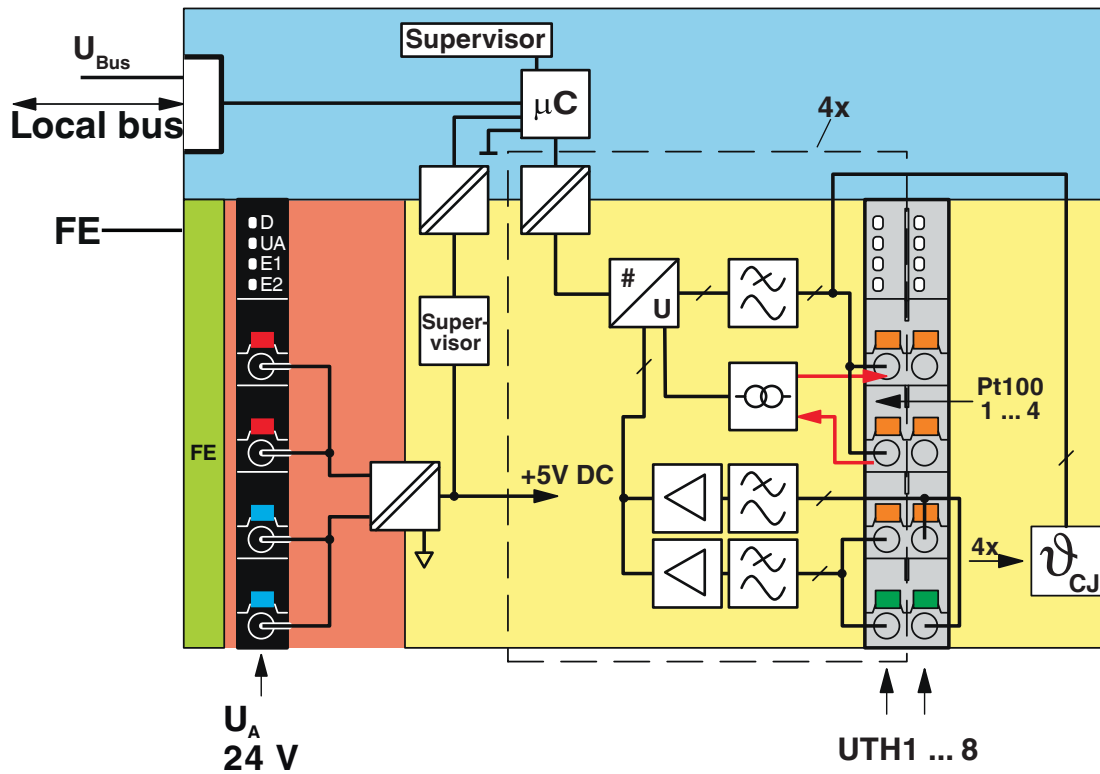
# AXL F UTH8 XC 1F - Temperature module

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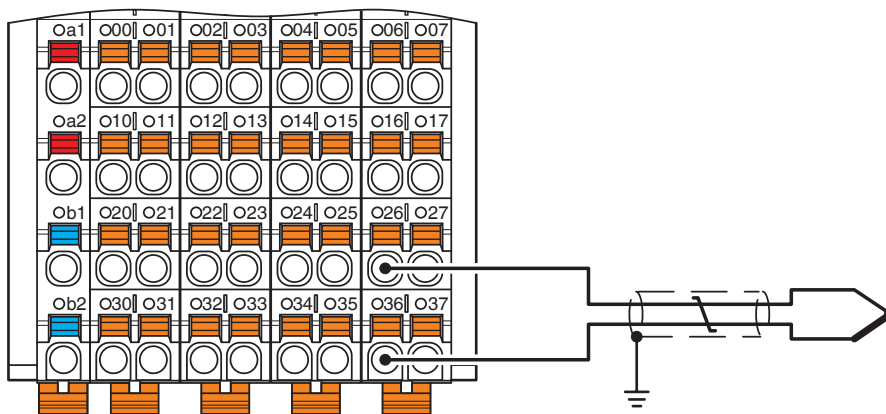
## Drawings

Block diagram



Internal wiring of the terminal points

Connection diagram



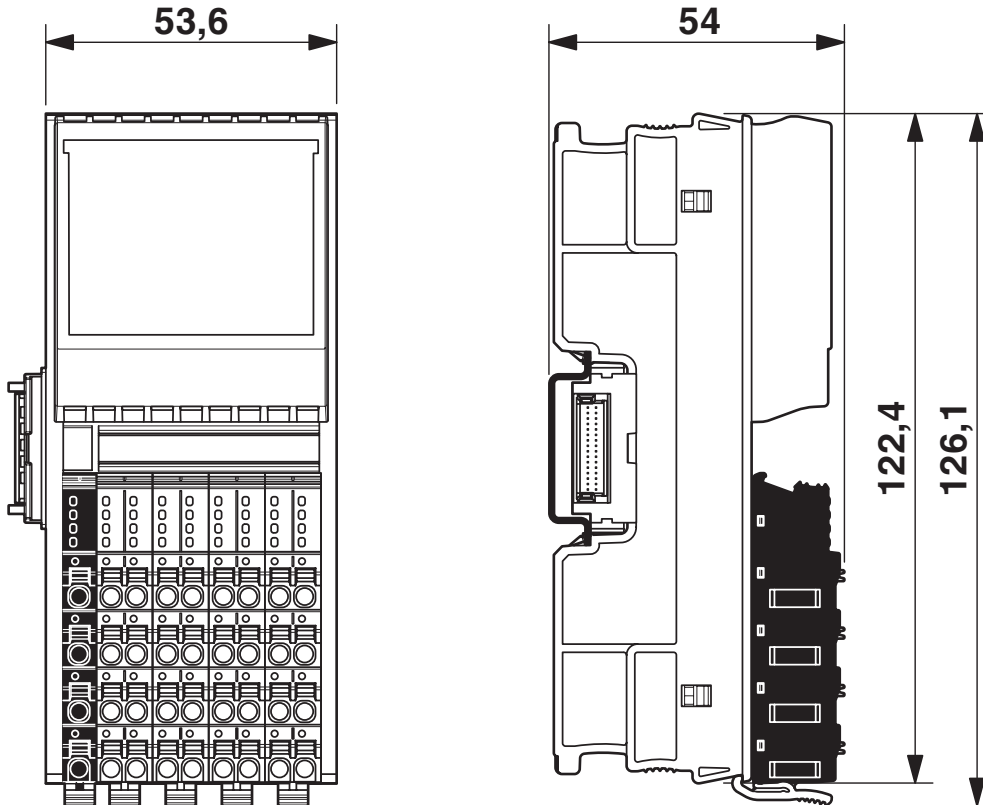
# AXL F UTH8 XC 1F - Temperature module



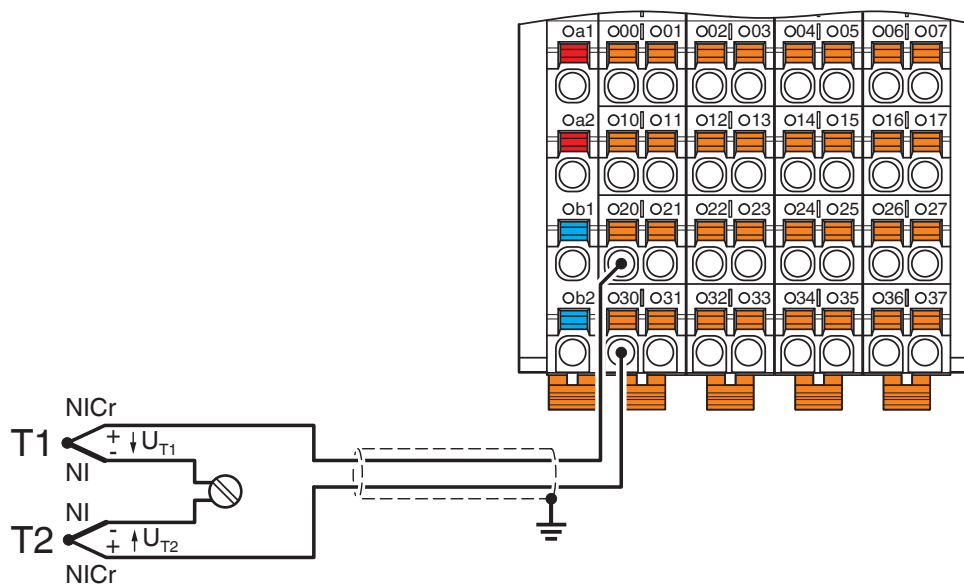
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Dimensional drawing



Connection diagram



Differential temperature measurement



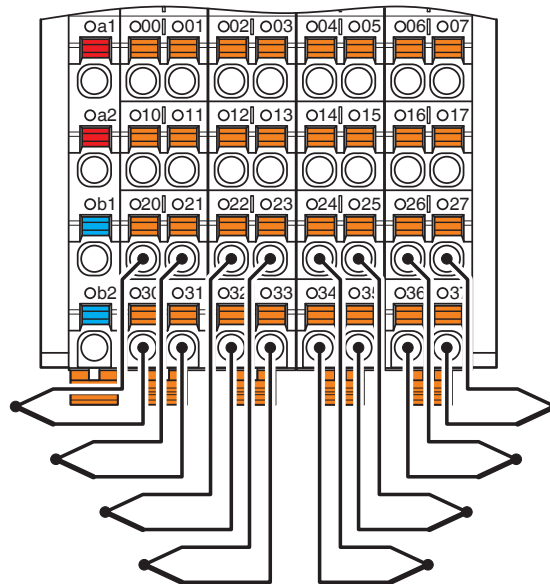
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Connection diagram



Connection example: absolute temperature measurement

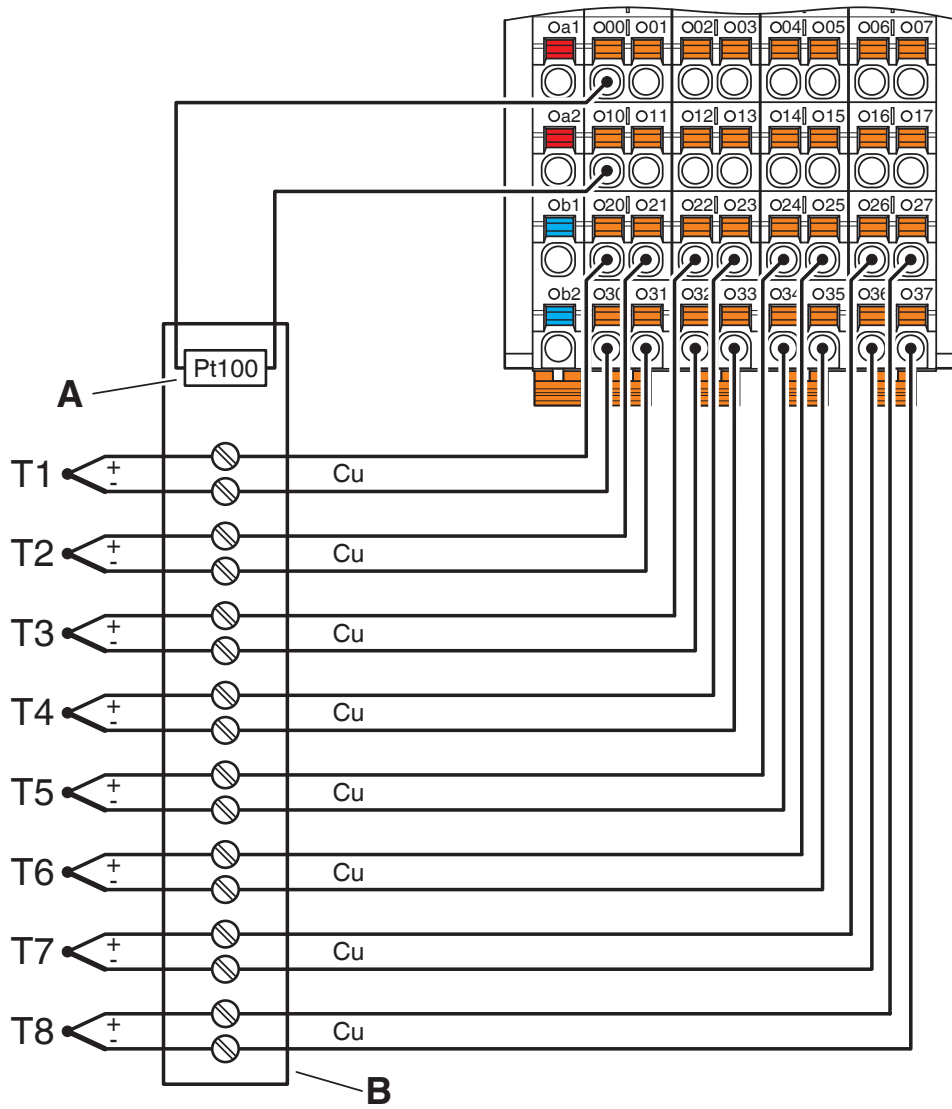
# AXL F UTH8 XC 1F - Temperature module



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Connection diagram



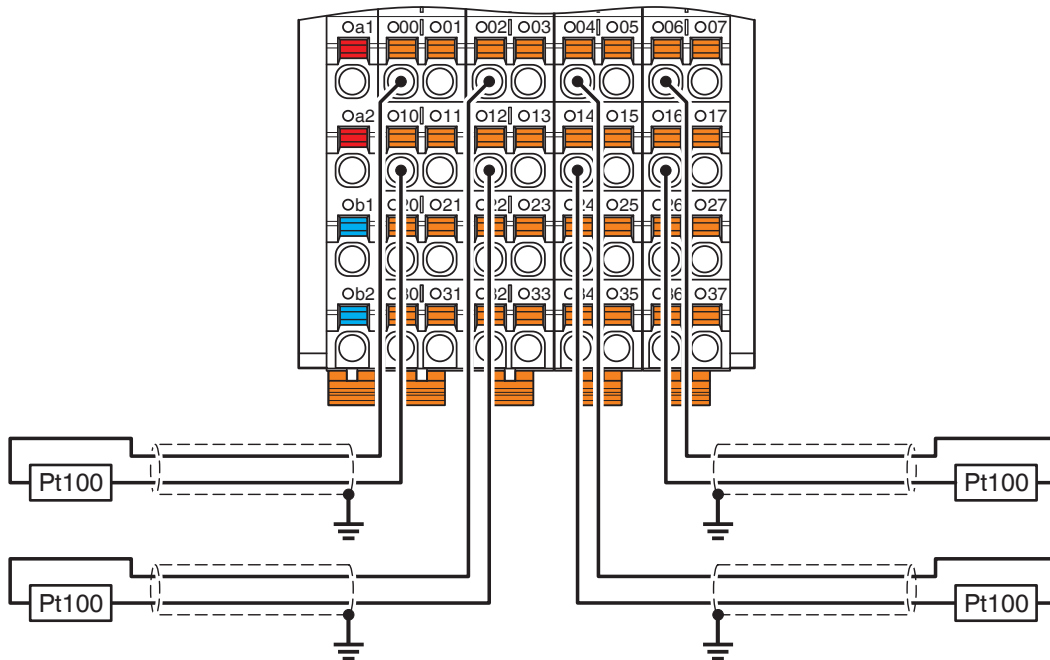
Thermocouple detection with external cold junction compensation at channel 1

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Connection diagram



Pt 100 detection

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## Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/us/products/2702464>



**IECEx**

Approval ID: IECEx ULD 20.0026X



**ATEX**

Approval ID: UL 20 ATEX 2441X



**cULus Listed**

Approval ID: E366272



**CCC**

Approval ID: 2021122309114456\_CN

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## Classifications

### ECLASS

ECLASS-11.0	27242601
ECLASS-12.0	27242601
ECLASS-13.0	27242601

### ETIM

ETIM 9.0	EC001596
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### 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)
SCIP	2fb73bed-1e62-43e7-9af0-1ad1e4fb14f6

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## Accessories

### AXL F BS F - Bus connector

2688129

<https://www.phoenixcontact.com/us/products/2688129>



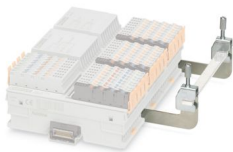
Axioline F bus base module for housing type F

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### AXL SHIELD SET - Shield connection

2700518

<https://www.phoenixcontact.com/us/products/2700518>



Axioline shield connection set (contains 2 shield bus holders and 2 SK 5 shield connection clamps)

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## ZB 20,3 AXL UNPRINTED - Zack marker strip

0829579

<https://www.phoenixcontact.com/us/products/0829579>



Zack marker strip for Axioline F (device labeling), in 2 x 20.3 mm pitch, unprinted, 25-section, for individual labeling with B-STIFT 0.8, X-PEN, or CMS-P1-PLOTTER

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## ZBF 10/5,8 AXL UNPRINTED - Zack Marker strip, flat

0829580

<https://www.phoenixcontact.com/us/products/0829580>



Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: PLOTMARK, CMS-P1-PLOTTER, mounting type: latching, for terminal block width: 10.15 mm, lettering field size: 4 x 10, 15 x 5 mm, 1 x 5.8 x 5 mm, Number of individual labels: 50



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## MTKD-CU/CUNI - Thermoelectric voltage terminal block pair

3100059

<https://www.phoenixcontact.com/us/products/3100059>



Thermoelectric voltage terminal block pair, TC type T, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, 1 level, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

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## MTKD-FE/CUNI - Thermoelectric voltage terminal block pair

3100046

<https://www.phoenixcontact.com/us/products/3100046>



Thermoelectric voltage terminal block pair, TC type J, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, 1 level, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

# AXL F UTH8 XC 1F - Temperature module

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## MTKD-NICR/CUNI - Thermoelectric voltage terminal block pair

3100075

<https://www.phoenixcontact.com/us/products/3100075>



Thermoelectric voltage terminal block pair, TC type E, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, 1 level, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

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## MTKD-NICR/NI - Thermoelectric voltage terminal block pair

3100062

<https://www.phoenixcontact.com/us/products/3100062>



Thermoelectric voltage terminal block pair, TC type K, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, 1 level, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

# AXL F UTH8 XC 1F - Temperature module

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## MTKD-E-CU/A-CU - Thermoelectric voltage terminal block pair

3100091

<https://www.phoenixcontact.com/us/products/3100091>



Thermoelectric voltage terminal block pair, TC type R, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, 1 level, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

## MTKD-S-CU/E-CU - Thermoelectric voltage terminal block pair

3100101

<https://www.phoenixcontact.com/us/products/3100101>



Thermoelectric voltage terminal block pair, TC type B, nom. voltage: 400 V, nominal current: 1 A, number of connections: 4, number of positions: 2, connection method: Screw connection, cross section: 0.2 mm<sup>2</sup> - 4 mm<sup>2</sup>, mounting type: NS 35/7,5, NS 35/15, NS 32, color: gray

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## EMT (35X46)R - Insert label

0801604

<https://www.phoenixcontact.com/us/products/0801604>



Insert label, for marking the Axioline F series from Phoenix Contact, Roll, white, unlabeled, can be labeled with: THERMOMARK E.300 (D)/600 (D), THERMOMARK ROLL 2.0, THERMOMARK ROLL, THERMOMARK ROLL X1, THERMOMARK ROLLMaster 300/600, THERMOMARK X1.2, mounting type: insert, lettering field size: 35 x 46 mm, Number of individual labels: 500

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