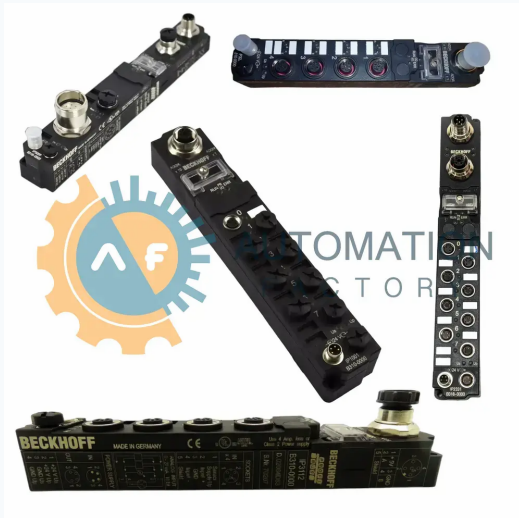


Beckhoff — IP Compact Box Units

IP3312-B310-0000



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The **IP3312-B310-0000** is a thermocouple input module manufactured by Beckhoff as part of the IP Compact Box Units series. Housed in a sealed metal body, this unit mounts in the field and connects to an EtherCAT trunk without a control-cabinet enclosure. Its task is to capture temperature signals from multiple sensing points, digitize them, and forward the values to the PLC so that heaters, coolers, and safety interlocks can be controlled with accurate real-time data in industrial automation.

It provides **four analog inputs** that use a 2-wire connection to minimize sensor cabling. Cold-junction compensation is handled by the ZS2000-3712 reference element, and the module checks for open circuits through its integrated broken-wire detection function. Raw sensor data is quantized at a resolution of **0.1 °C per digit**, while a complete conversion cycle takes **260 ms**. Under rated conditions, the measurement error remains within **±0.5% of full scale**, supporting stable process control. Each input channel is galvanically separated from the control bus by **500 V** of isolation, protecting upstream electronics from ground loops and transients. Four selectable input filters allow the response speed to be balanced against electrical noise.

The default thermocouple assignment is type **K**, but the module can be configured for other element types when required. The enclosure meets **IP65/IP66/IP67** protection ratings, allowing it to withstand dust, water jets, and temporary immersion. Power and EtherCAT connections use **one 4-pin M8 connector and one 4-pin M8 socket**, while the thermocouples attach through an M12 screw-in block that resists vibration. The electronics draw their sensor supply directly from the load voltage US, eliminating the need for a separate auxiliary feed. In the controller's

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process image, the module provides **four 16-bit inputs with optional four 8-bit and four 16-bit data fields**, supplying measurement resolution and diagnostic data for each channel.

Specifications

2-wire Technique:	yes	Approvals/markings:	CE, UL	Broken Wire Detect:	yes
Channel/control Isolation:	500 V	Cold Junction Comp:	ZS2000-3712	Connection Method:	M12 socket, 2-wire connection for thermocouple
Conversion Time:	260 ms	Default Thermocouple:	K	Emc Immunity/emission:	Conforms to EN 61000-6-2/EN 61000-6-4
Housing Dimensions:	30 mm x 175 mm x 26.5 mm	Input Connections:	M12, screw type	Input Filter:	4 versions
Measurement Error:	<±0.5% of full scale	Measurement Error/uncertainty:	< ±0.5% (relative to full scale value)	Measuring Range:	Depending on sensor type; preset value is type K, -100...+1370°C
Number Of Channels:	4 analog inputs	Number Of Inputs:	4	Operating Temperature:	0...55°C
Power Connectors:	1x M8 connector + 1x M8 socket, 4-pin	Power Supply:	24V DC (-15%/+20%); load voltage varies as per I/O	Process Image Bits:	4x16-bit in; opt 4x8-bit + 4x16-bit
Protection Class:	IP65/IP66/IP67	Protection Rating:	IP65/66/67 (conforms to EN 60529)	Resolution:	0.1°C per digit
Sensor Supply:	from load voltage US	Sensor Types:	Types J, K, L, B, E, N, R, S, T, U (default setting type K), mV measurement	Signal Connection:	M12 screw-in
Storage Temperature:	-25...+85°C	Last Verified:	10/26/2026 4:25 AM		

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