KeConnect C2

C2-TM 220/A Temperature Module

- Temperature module
- Thermocouple type J, K
- Internal and external cold junction compensation
- High measurement precision
- Galvanic isolation
- Sensor failure detection
- Cost savings through omission of expensive thermocouple line

Brief description

The C2-TM 220/A is a temperature measurement module from the Keba module system. The module is added directly on to a central processor module. A bus link module is used to operate this module with all product lines of the KeControl C2 system.

This analog input module allows direct connection of thermocouples. Up to 3 thermocouples can be operated in 2 conductor technology. A micro-controller realizes the calibration and linearization of the temperature values. The inputs are galvanic isolated against each other and to the drive electronics. Tow operating modes are supported in the TM 220. The standard mode outputs the actually measured temperature. The second mode is used to display the measured voltage in µV. A sensor failure is notified to the superior central processor module and can be evaluated in the application. The cold junction compensation can be achieved in two different ways: through internal temperature measurements at the terminals of the module and/or through external terminal temperature compensation.

The external terminal temperature compensation can provide measurement precision of up +/-0.5°C over the entire temperature range. The external relocation of the terminal points for the thermocouples allows reducing costs by shortening the expensive thermocouple lines.

Technical Data

General information

Power supply voltage:	internally via K-Bus
Power consumption at K-Bus:	max. 0.5 W

Temperature inputs

Number of inputs:	3	
Galvanic isolation:	Yes	
Diagnosis:	Sensor failure detection	
Thermocouple types:	J, K	
Measurement ranges:	Type J (Fe-CuNi):	-100 to +700 °C, Linearization according to IEC 548-1
	Type K (NiCr-Ni):	-100 to +1000 °C Linearization according to IEC 548-1
Measurement principle:	Integrating	
Measuring time:	100 ms	
Input resistance:	>10 kΩ	
Resolution of the measurement process:	14 Bit	
Connections:	Plug-in connection terminals, gold-plated contacts, Nominal cross section: 1.5 mm^2	
Intrinsic deviation:	± 1.0 °C max. absolute measurement deviation at 25 °C ambient temp. at the module [1)] via the entire measuring range (± 0.5 °C typical)	
Error terminal temperature sensor:	± 1 °C max. absolute measurement deviation at 0 °C - 70 °C ambient temp. (± 0.5 % typical)	
Operational deviation:	± 1.5 °C max. absolute measurement deviation at 0 °C to 55 °C ambient temp. at the module [1)] via the entire measuring range (± 1 °C typical)	
Thermal settling time:	The measurement result is stable after 20 min and is within the tolerances specified	
Error at external compensation with TE 220/A:	With the optimized positioning of the external sensor TE 220/1 the error of the measurement system can be minimized to ± 0.5 °C.	

[1)] discounting external parasitic couplings

Dimensions:

Footprint:	
Module height:	120 mm
Mounting depth:	100 mm
Front panel width:	22.5 mm
Module width (incl. K-Bus plug):	32.5 mm
Weight:	133 g

Standards:

The module conforms to the following standards:

General information	
UL 508	UL – planned
Product standard for programmable controllers:	
IEC 61131-1:2003	General information
IEC 61131-2:2003	Hardware