

Product description

I/O compound modules - temperature measurement

Two analog inputs for thermocouple measurement - EPM-S405

3.8.3 Two analog inputs for thermocouple measurement - EPM-S405

This module detects up to two analog control signals from the process level and transmits them to the higher-level bus system.

Features

- ▶ 2 analog inputs
- ▶ For thermocouple type B, C, E, J, K, L, N, R, S or T
- ▶ 16-bit resolution
- ▶ Internal temperature compensation
- ▶ Signal function is parameterisable
- ▶ An LED indicates if an input voltage is outside the permitted measuring range



Stop!

Overvoltage at the inputs

The electronics of the electronic module are not protected against too high input signals.

Possible consequences:

- ▶ The module is destroyed

Protective measures:

- ▶ Make sure that the signals and encoders connected match the measuring range parameterised.

Mounting instructions

Variations in temperature within the module may affect the measuring accuracy. Therefore please observe the following recommendations:

- ▶ Do **not** place the module...
 - directly next to the bus coupler module
 - directly next to a power supply module
 - in a position as the last module within an I/O system
- ▶ If possible, the ambient temperature should be constant. After a change in the ambient temperature, the module requires approx. 30 minutes until obtaining its ensured measuring accuracy.

Overview

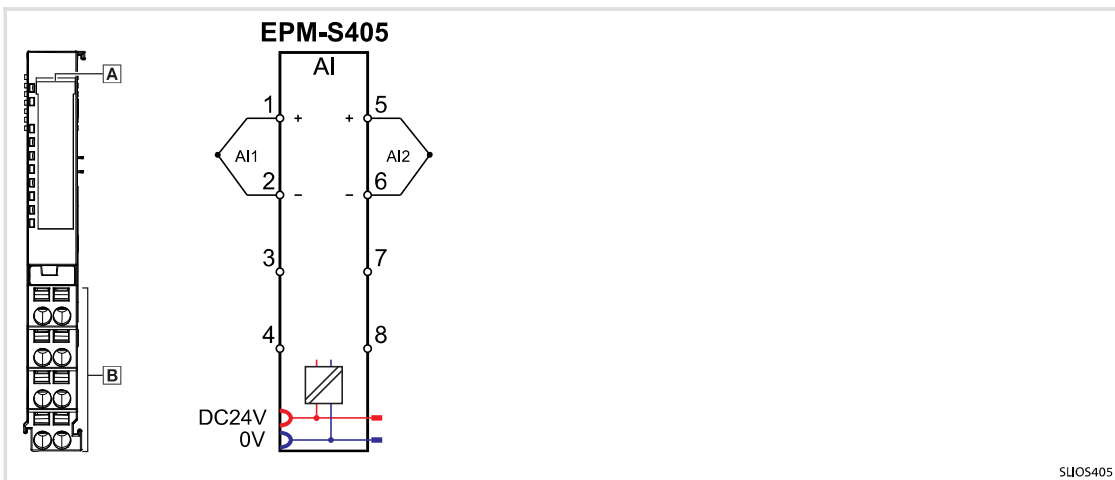


Fig. 3-56 Elements and circuit diagram

- A** Displays for module status
- B** Terminals
- 1 ... 8 Connection number

Status displays

Module status LEDs A				
View	Pos.	Designation	Colour	Explanation
	1	RUN	Green	On: Module is ready for operation (see following table)
	2	MF	Red	On: Module error (see table below)
	3	AI1	Red	On: Channel 1, signal outside the measuring range, parameterisation error, open circuit
	4	AI2	Red	On: Channel 2, signal outside the measuring range, parameterisation error, open circuit
	5			Not assigned
	6			
	7			
	8			
	9			
	10			


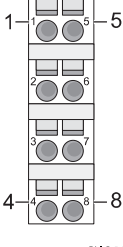
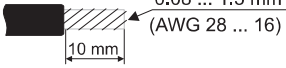
Messages of the status LEDs RUN and MF		
RUN	MF	Meaning
On	Off	Module status OK Bus communication is OK
On	On	Module reports error Bus communication is OK
Off	On	Module reports error Bus communication not possible
Off	Off	Error in the bus supply voltage
Blinking	Blinking	Configuration error (see 274)

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Terminals

Module terminals, spring terminals 			
View	Designation	Explanation	Terminal data
 SU0002	1	Analog input AI1 (+)	 0.08 ... 1.5 mm ² (AWG 28 ... 16) 10 mm
	2	Analog input AI1 (GND)	
	3	Not assigned	
	4		
	5	Analog input AI2 (+)	
	6	Analog input AI2 (GND)	
	7	Not assigned	
	8		



Note!

- ▶ Use parameter setting to deactivate unused inputs.
- ▶ The module does not provide any auxiliary supply for sensors.

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Technical data

EPM-S405: Rated data	
Module identifier	1027 _{dec}
Current consumption/power loss	
Current consumption from backplane bus	75 mA
Power loss	1 W
Analog inputs	
Number of inputs	2
Cable length	
shielded	200 m
Load voltage	
Nominal value	DC 24 V
Current consumption from load voltage L+	30 mA (without load)
Voltage inputs	
Input voltage ranges	-80 mV ... +80 mV
Destruction limit (input voltage)	30 V
Operational error limit	With interference frequency suppression: ± 0.1 % Without interference frequency suppression: ± 0.3 %
Basic error limit	With interference frequency suppression: ± 0.05 % Without interference frequency suppression: ± 0.25 %
Thermocouple inputs	
Thermocouple ranges	Types B, C, E, J, K, L, N, R, S, T
Operational error limit	With interference frequency suppression: Types E, L, T, J, K, N: ± 1.5 K Types B, C, R, S: ± 4.0 K Without interference frequency suppression: Types E, L, T, J, K, N: ± 2.5 K Types B, C, R, S: ± 8.0 K
Basic error limit	With interference frequency suppression: Types E, L, T, J, K, N: ± 1.0 K Types B, C, R, S: ± 3.0 K Without interference frequency suppression: Types E, L, T, J, K, N: ± 2.0 K Types B, C, R, S: ± 7.0 K
Measuring principle	Sigma-delta
Resolution	16 bits
Basic conversion time	4.2 ... 324.1 ms (50 Hz) per channel 3.8 ... 270.5 ms (60 Hz) per channel
Interference voltage suppression for a frequency of	> 90 dB bei 50 Hz (UCM < 10 V)
Temperature error (relating to input range)	± 0.001 %/K
Linearity distortion (relating to input range)	± 0.005 %
Repeat accuracy (in steady-state vibration at 25°C, relating to the input range)	± 0.05 %
Temperature error of the internal compensation	± 0.2 %
Temperature compensation	
parameterisable	Yes
external	Yes
internal	Yes
Input data size	4 bytes

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EPM-S405: Rated data

Status, alarm, diagnostics

Status display	Yes
Alarms	Yes
Process alarm	Yes, parameterisable
Diagnostic alarm	Yes, parameterisable
Diagnostic function	Yes
Diagnostic information can be read out	Possible
Module status	Green LED
Module error display	Red LED
Channel error display	Red LEDs per channel

Electrical isolation

Between the channels and the backplane bus	Yes
Between the channels and the voltage supply	Yes
Max. potential difference between inputs (U_{cm})	DC 140 V / AC 60 V
Max. potential difference between the analog channel (e.g. input) and the I/O supply	DC 75 V / AC 60 V
Insulation checked with	DC 500 V