

# A6500-TP Temperature/ Process Card

The A6500-TP Temperature Process Card is a component of the AMS 6500 ATG Machine Protection System. The card is equipped with 4 measuring channels for temperature measurements with thermocouples or resistance temperature detectors (RTDs) and for measurements of process signals 0-1 V, 0-10 V or 0/4-20 mA standard signals. Besides this, the card contains 2 digital inputs and 6 digital outputs. The measured signals are transmitted through the internal RS 485 bus to the A6500-CC Com Card and converted to Modbus RTU and Modbus TCP/IP protocols for further transmission to host computers or analysis systems. In addition, the Com Card provides the communication through the USB socket at the face plate for the connection to PC/laptop for the configuration of protection cards and for visualization of measuring results. Apart from that, the measuring results can be output through analog outputs 0/4-20 mA. These outputs have a common ground and are electrically isolated from system supply. The operation of the A6500-TP Temperature Process Card is performed in the A6500-SR System Rack, which also provides connection of supply voltages and signals. The A6500-TP Temperature Process Card provides the following functions:

- Temperature measurement with RTDs
- Temperature measurement with thermocouples with internal and external cold junction compensation
- Measurement of standard process signals 0-1 V, 0-10 V or 0/4-20 mA
- Acquisition of digital signals with two digital inputs
- Output of analog values for each measuring channel through 4 current outputs 0/4-20 mA
- Output of alarms through 6 digital outputs, the assignment to the measuring channels can be configured in any way

Signal Inputs	
Number of Inputs	Four (Up to Eight for temperature sensors in thermocouple mode) - independently configurable for different temperature sensors or process signal inputs, nonreactive, short circuit proof.
Input Resolution	24 bit ADC
Isolation	The four inputs are galvanically isolated against each other based on levels of IEC 60204-1, respectively IEC 61131-2



- Four-channel, 3U size, 1-slot plug-in module decreases cabinet space requirements in half from traditional four-channel 6U size cards.
- API 670 compliant, hot-swappable module.
- Self-checking facilities include monitoring hardware, power input, hardware temperature, sensor, and cable.
- Use with 2,3 or wire RTD's, thermocouples, or analog process input signals.



Voltage Process Inputs	
Range	0 to 10 V
Accuracy	±1% of full scale
Impedance	>100 k $\Omega$
Temperature Drift	±0.5% of full scale within operating temperature range of -20°C to +70°C
Current Process Inputs	
Range	0/4 to 20 mA
Accuracy	±1% of full scale
Impedance	<200 $\Omega$
Temperature Drift	±0.5% of full scale within operating temperature range of -20°C to +70°C
RTD Sensor Inputs	
Type	Pt100 ( $\alpha$ =0.00385) Ni100 ( $\alpha$ =0.00618) Ni120 ( $\alpha$ =0.00672) Cu10 ( $\alpha$ =0.00427)
Technology	2-, 3-, and 4-wire (Cu10 is not applicable in 2-wire technology)
Accuracy	±1 K
Excitation Current	500 $\mu$ A
Cable Resistance	<120 $\Omega$ per wire and if ex-application, including possible safety barrier impedance
Temperature Drift	±1 K within operating temperature range of -20°C to +70°C
Thermocouple Inputs	
Type	E, J, K, T, N
Accuracy	±1 K
Cold Junction Compensation	exterior use RTD sensor input for cold junction compensation (CJC)
Capacity	<10 $\mu$ F including sensor cable
Temperature Drift	±1 K within operating temperature range of -20°C to +70°C

Environmental, General		
Protection Class	IP20, IEC 60529	
Conformal Coating	Airborne contaminants resistance	ISA-S71.04-1985 airborne contaminants class G3
	Material: HumiSeal® 1B31 EPA	According to IPC-CC-830B and IPC-A 610
Operating Temperature	-20° to 70°C (-4° to 158°F) with forced cooling	
	-20° to 55°C (-4° to 131°F) without forced cooling	
Storage Temperature	-40°C to +85°C (-40°F to 185°F)	
Relative Humidity	5 to 95%, non-condensing	
Vibration	IEC 60068-2-6 0.15mm, 10-55Hz 20m/s <sup>2</sup> , 55-150Hz	
Shock	150 m/s <sup>2</sup> 4000 shocks per axis	
EMR Resistance	EN50081-1 / EN50082-2	
Power Consumption	Max. 5W	
Configuration	Password protected	
Rack Slot	3RU/6HP	
Board Dimensions	PCB/EURO card format according to DIN 41494, 100 x 160mm (3.937 x 6.300in)	
Weight	app 200g exclusive packaging	

Compliance and Certifications	
CE	EMC – EN61326-1 2014/30/EU 2014/34/EU 2011/65/EU
ATEX	EN 60079-0:2012 EN 60079-15:2010
IEC-Ex	IEC 60079-0:2011; Edition: 6.0
CCOE PESO India	IEC 60079-15:2010; Edition: 4

CSA	CAN/CSA-C22.2 NO. 0-10 CAN/CSA-C22.2 NO. 61010-1-12 CAN/CSA-C22.2 NO. 60079-0:15 CAN/CSA-C22.2 NO. 60079-15:12 IEC 60529:2013 + COR2:2015 UL 61010-1:12 UL 60079-0:13 UL 60079-15:13
EAC	TP TC 012/2011 ГОСТ 31610.0-2014 ГОСТ 31610.15-2014
CCC	GB 3836.1-2010 GB 3836.8-2014
Marine	DNV GL rules for classification – Ships and offshore units
Safety (SIL): SC 2 (SIL 2 Capable)	IEC 61508:2010 Parts 1-7

## Hazardous Area Approvals

Non-sparking nA in combination with nC	
ATEX	II 3G – Ex nA nC IIC Gc, $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$ (with $T_s \leq 70^{\circ}\text{C}$ the requirements for temperature class T4 are met)
IEC-Ex	II 3G – Ex nA nC IIC Gc, $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$ (with $T_s \leq 70^{\circ}\text{C}$ the requirements for temperature class T4 are met)
CSA	Class I Division 2, Groups A, B, C, D, T4 Class 1, Zone 2 Ex / AEx nA nC IIC T4 Gc (the ambient temperature within the end use enclosure shall not exceed 55°C)
EAC-Ex	Ex nA nC IIC Gc,U $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$
CCC-Ex	Ex nA nC IIC Gc $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$
CCOE PESO India	Ex nA nC IIC T4 Gc, $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$ (with $T_s \leq 70^{\circ}\text{C}$ the requirements for temperature class T4 are met)
KTL Korea	Ex nA nC IIC $-20^{\circ}\text{C} \leq T_s \leq 70^{\circ}\text{C}$

## Ordering Information

Model Number	Product Description
A6500-TP	A6500-TP-TEMPERATURE/ PROCESS CARD

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