

Signal Conditioners

Thermocouple Signal Conditioners

Universal Thermocouple, 3-Way

- Universally adjustable using DIP switch
- 931S Configurator to assist with DIP switch selection, download at www.ab.com
- Three way isolation
- Internal cold-junction compensation
- Power supply can be cross-connected using center jumpers

931S-T9C2D-DC

Specifications	Universal Thermocouple, 3 Way	
Wiring Diagram		
Standards Compliance	UL 508, UL 1604, CSA C22.2 No. 142-M1987, CSA C22.2 No. 213-1987, EN 50178:1997, EN 61000-6-1:2007, EN 61000-6-2: 2005, EN 61000-6-3:2007, EN 61000-6-4:2007	
Certifications	cULus (Class 1, Div. 2, Groups A, B, C and D, NRAG/7.E10314), CE	
Input Ratings		
Sensor	Thermo element (IEC 584) type: K,J,T,E,N,R,S,B	
Temperature Range	-200...+1820 °C	
Input	Passive	
Output Ratings		
Voltage	0...10V	
Current	0...20 mA / 4...20 mA	
Load Impedance (voltage/current)	≥ 1 kΩ / ≤ 600 Ω	
Step Response Time	max. 1.4 s; with filter, max. 7.5 ms	
Line resistance in measuring circuit	50 Ω for 3- and 4-conductor	
Offset Current/Voltage	≥ 1 kΩ / ≤ 600 Ω	
Wire Break Detection	LED Flashes (output value > 20 mA, >10V)	
Fine Adjustment	± 5 % (switchable)	
Status Indicator	Active: LED On; Wire Broken: LED Flashes; Error: LED Off	
Output	Active	
General Specifications		
Supply Voltage	24V DC ± 25 %	
Power Consumption	830...880...980mW at I _{OUT} = 20 mA	
Current-carrying Capacity of Cross-Connect	≤ 2 A	
Operating Temperature	0 °C...+55 °C	
Storage Temperature	-20 °C...+85 °C	
Default Settings	Type K/ 0...1000 °C / 4...20 mA / filter off / man. calibration off	
Rated Insulation Voltage	300V	
Impulse Withstand Voltage	4 kV	
Isolation Voltage Input - Output	2 kV _{eff} / 5 s	
Surge Category	III	
Pollution Severity	2	
Connection Type	Screw	
L x W x D (mm)	92.4 x 17.5 x 112.4	
Signal Conditioner	Cat. No.	Pkg. Quantity
	931S-T9C2D-DC	1

Select of thermocoupler				Selection of minimum temperature			
Typ	SW1			min	SW1		
K	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
J	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-10°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-20°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-30°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-40°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
R	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-50°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-100°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-150°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
				-200°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
				+50°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				+100°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				+150°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				+200°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				+250°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				500°C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				Special range	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Selection of temperature span					Selection of output	
Span	SW2				Output	SW2
100°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0...10V	<input checked="" type="checkbox"/>
150°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	0...20mA	<input type="checkbox"/>
200°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4...20mA	<input checked="" type="checkbox"/>
250°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
300°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
350°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
400°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
450°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
500°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
550°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
600°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
650°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
700°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
750°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
800°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
850°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
900°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
950°C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1000°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1050°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1100°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1150°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1200°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1250°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1300°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1350°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1400°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1450°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1500°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1600°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1700°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
1800°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Switching on the manual fine adjustment	
man. adjust.	SW1
off	<input type="checkbox"/>
on	<input checked="" type="checkbox"/>

Switching on the filter function	
Filter	SW2
off	<input type="checkbox"/>
on	<input checked="" type="checkbox"/>

Temperature coefficient	
K -200°C...-150°C	± (6K + 0.1% of set range)
-150°C...1200°C	± (3K + 0.1% of set range)
1200°C...1372°C	± (4K + 0.1% of set range)
J -200°C...-150°C	± (4K + 0.1% of set range)
-150°C...1200°C	± (3K + 0.1% of set range)
T -200°C...-150°C	± (5K + 0.1% of set range)
-150°C...400°C	± (3K + 0.1% of set range)
E -200°C...-150°C	± (4K + 0.1% of set range)
-150°C...1000°C	± (3K + 0.1% of set range)
N -200°C...-150°C	± (6K + 0.1% of set range)
-150°C...1300°C	± (3K + 0.1% of set range)
R -50°C...200°C	± (10K + 0.1% of set range)
200°C...1760°C	± (6K + 0.1% of set range)
S -50°C...200°C	± (10K + 0.1% of set range)
200°C...1760°C	± (6K + 0.1% of set range)
B 50°C...250°C	± (25K + 0.1% of set range)
250°C...500°C	± (10K + 0.1% of set range)
500°C...1820°C	± (6K + 0.1% of set range)