DATASHEET

SPMK51X Multifunction process calibrator

BCLog-Control

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SPMK51X
Series Multi-function Process Calibrator



Product Description

Whether for troubleshooting or normal maintenance or calibration, SPMK51X series of multifunction process calibrators will help you accomplish your tasks quickly and accurately.

Product Characteristics

- **Variety of functions**
  Calibrate pressure, temperature, voltage, current, frequency, pulse, resistance. Both measurement and source functions.
- **Measurement and source functions**
  Measures 13 types of thermocouples and 11 types of RTDs and provides analog output with cold end compensation.
- **Data storage function**
  No need to worry about data loss. Supports output methods such as step or program.
- **Built-in HART function**
  It can calibrate and maintain HART-type instruments, and realize functions such as management of instrument basic information, range migration, zero point and full scale calibration (only for SPMK516 and SPMK518).
- **Support external pressure modules**
  SDP pressure module (only for SPMK517 and SPMK518) (optional).
- **Task management function**
- **Analog transmitters**
  Generate precise electrical, temperature or pressure signals.
- **Provides commonly used tools**
  Thermal engineering treasure trove, user-built RTD library, temperature and pressure unit conversion.
- **Automatic cold-end compensation technology**
  Built-in cold end insulation module for fast tracking of temperature changes.
- **3.5-inch high-resolution TFT display**
- **Chinese and English languages available**
- **RS232 interface and open communication protocol**
- **Provide a 24VDC loop power supply with measurement and output isolated from each other**
- **Warranty: 1 year**

Product Functions

Function		SPMK510	SPMK516	SPMK517	SPMK518
Measurement	Millivolt	★	★	★	★
	Voltage	★	★	★	★
	Current	★	★	★	★
	Frequency		★	★	★
	Pulse		★	★	★
	Resistance		★	★	★
	On-off	★	★	★	★
	11 RTDs		★	★	★
	13 thermocouples		★	★	★
Source	Millivolt	★	★	★	★
	Voltage	★	★	★	★
	Current	★	★	★	★
	Frequency		★	★	★
	Resistance		★	★	★
	Simulate 11 RTDs		★	★	★
	Simulate 13 thermocouples		★	★	★
Other Functions	HART communication		★		★
	External pressure module①			★	★
	Thermal book		★	★	★
	Step programming output	★	★	★	★
	24V loop current	★	★	★	★
	Simulating transmitter		★	★	★
	RS232 communication	★	★	★	★
	Storage	★	★	★	★

Note: SPMK510 millivolt measurement and output range is wider. Measurement range (-200~200)mV, output range (-10~200)mV, loop integrity test range (0~2000)Ω.

① External pressure module means SDP module produced by our company.

Technical Parameters

Electrical Signal Measurement Specifications (Ambient Temperature (20±5) °C, 1 year Accuracy)

Signal		Range	Accuracy	Resolution
Current		(-30-30)mA	± (0.01%RD+0.005%FS)	0.1 μA
Voltage		(-30-30)V	± (0.01%RD+0.005%FS)	0.1 mV
Millivolt		(-75-75)mV	± (0.01%RD+0.005%FS)	0.1 μV
Resistance	R-3W	(0-400)Ω (0-4000)Ω	± (0.02%RD+0.005%FS)	1mΩ 10mΩ
	R-4W	(0-400)Ω (0-4000)Ω	± (0.01%RD+0.005%FS)	1mΩ 10mΩ
Frequency		(1-50000)Hz	± (0.005%RD+0.002%FS)	1Hz
Pulse		0-999999	±1	1
Switch (on/off)		If the switch is equipped with an inspection voltage, the voltage range is (3~24)V		
Thermocouples		k、E、J、T、N、R、S、B、C、D、G、L、U		
RTDs		Pt1000(385)、Pt500(385)、Pt100(385)、Pt100(3916)、Pt100(3926)、Pt10(385)、Cu10(427)、Cu50(428)、Cu100(428)、Ni120(672)、Ni100(618)		
Pressure range		Refer to the Pressure Range Selection Chart (SPMK518, SPMK517 only).		

Electrical Source Specifications (Ambient Temperature (20±5)℃, 1 year accuracy)

Signal	Range	Accuracy	Resolution
Current	(0-22)mA	± (0.02%RD+0.005%FS)	0.1μA
Voltage	(0-12)V	± (0.02%RD+0.005%FS)	0.1mV
Millivolt	(-10-100)mV	± (0.02%RD+0.005%FS)	1μV
Resistance	(0-400)Ω (400-4000)Ω	± (0.02%RD+0.005%FS) ± (0.03%RD+0.01%FS)	1mΩ 10mΩ
Frequency	(0-50000)Hz	± (0.005%RD+0.002%FS)	0.lHz
Pulse	0-999999	±1	1
24VDC	(24±0.5)V maximum load 50mA		
Simulating thermocouple	k, E, J, T, N, R, S, B, C, D, G, L, U		
Simulating RTDs	Pt1000(385)、Pt500(385)、Pt100(385)、Pt100(3916)、Pt100(3926)、Pt10(385)、Cul0(427)、Cu50(428)、Cu100(428)、Ni120(672)、Ni100(618)		

Electrical Source Specifications (Ambient Temperature (20±5)℃， 1 year accuracy)

Thermocouple type	Reference	Temperature range (℃)	Tolerance temperature range (℃)	Maximum permissible error (℃)	
				Measurement	Output
Type K	IEC584	-270~1372	-200~-100	±0.4	±0.6
			-100~600	±0.3	±0.3
			600~1372	±0.4	±0.5
Type E	IEC584	-270~1000	-200~-100	±0.3	±0.4
			-100~600	±0.2	±0.2
			600~1000	±0.2	±0.4
Type J	IEC584	-210~1200	-210~-100	±0.3	±0.4
			-100~1200	±0.3	±0.3
Type T	IEC584	-270~400	-200~0	±0.4	±0.5
			0~300	±0.2	±0.3
			300~400	±0.2	±0.2
Type N	IEC584	-270~1300	-200~-100	±0.5	±0.6
			-100~1300	±0.4	±0.5
Type R	IEC584	-50~1768	-50~100	±1.4	±1.5
			100~500	±0.6	±0.7
			500~1768	±0.7	±0.7
Type S	IEC584	-50~1768	-50~100	±1.1	±1.2
			100~400	±1.0	±1.1
			400~1768	±0.7	±0.8
Type B	IEC584	0~1820	0~450	±3.8	±3.8
			450~800	±0.9	±1.0
			800~1200	±0.6	±0.7
			1200~1820	±0.6	±0.8
Type C	ASTM E988	0~2315	0~1000	±0.6	±0.7
			1000~1800	±0.8	±1.0
			1800~2315	±1.2	±1.5
Type D	ASTM E988	0~2315	0~100	±0.6	±0.6
			100~1100	±0.5	±0.6
			1100~2000	±0.8	±1.0
			2000~2315	±1.0	±1.4

Thermocouple type	Reference	Temperature range (℃)	Tolerance temperature range (℃)	Maximum permissible error (℃)	
				Measurement	Output
Type G	ASTM E1751	0~2315	0~200	±2.4	±2.5
			200~400	±0.5	±0.6
			400~1400	±0.4	±0.6
			1400~2315	±0.8	±1.0
Type L	DIN43710	-200~900	-200~-100	±0.3	±0.5
			-100~400	±0.2	±0.3
			400~900	±0.5	±0.6
Type U	DIN43710	-200~600	-200~0	±0.5	±0.4
			0~600	±0.3	±0.5

Measuring and Simulating RTD source temperature specifications using RTDs (ambient temperature (20±5)°C)

Thermocouple type	Reference	Temperature range (℃)	Tolerance applicable temperature range (℃)	Maximum permissible error (℃)		
				Measurement		Output
				3W	4W	
Pt1000（385）	IEC751	-200~850	-100~200	±0.13	±0.08	±0.29
			200~600	±0.24	±0.13	±0.45
			600~840	±0.32	±0.19	±0.56
Pt500（385）	IEC751	-200~850	-100~200	±0.22	±0.16	±0.35
			200~600	±0.35	±0.22	±0.56
			600~850	±0.39	±0.28	±0.69
Pt100（385）	IEC751	-200~850	-100~200	±0.18	±0.14	±0.18
			200~600	±0.27	±0.18	±0.27
			600~850	±0.36	±0.29	±0.36
Pt100（3926）	Minco Application Aid #18	-200~850	-100~200	±0.18	±0.14	±0.18
			200~600	±0.27	±0.18	±0.27
			600~850	±0.36	±0.29	±0.33
Pt100（3916）	JIS1604	-200~850	-100~200	±0.18	±0.14	±0.18
			200~600	±0.27	±0.18	±0.27
			600~850	±0.35	±0.29	±0.35
Pt10（385）	IEC751	-200~850	-100~200	±0.68	±0.64	±0.68
			200~600	±0.85	±0.82	±0.85
			600~850	±0.98	±0.89	±0.98
Cu100（428）	JB/T8623—1997	-50~150	-50~150	±0.15	±0.10	±0.16
Cu50（428）	JB/T8623—1997	-50~150	-50~150	±0.19	±0.17	±0.20

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Thermocouple type	Reference	Temperature range (℃)	Tolerance applicable temperature range (℃)	Maximum permissible error (℃)		
				Measurement		Output
				3W	4W	
Cu10（427）	Minco Application Aid #18	-100~260	-100~260	±0.65	±0.58	±0.65
Ni120（672）	Edison curve #7	-70~270	-70~270	±0.08	±0.06	±0.08
Ni100（618）	DIN43760	-70~190	-70~190	±0.10	±0.07	±0.10

General Technical Indicators

Project	Parameters
Display	6-digit display
Usage environment	Ambient temperature :(-10～50)℃; Relative humidity <90% noncondensing; Atmospheric pressure (86~106)kPa.a
Storage environment	Ambient temperature(-20～60)℃; Relative humidity <90% non-condensing
Power supply mode	AC and DC power supply (battery power is recommended for good measurement and output)
Dimensions	208mm(L)x101mm(W)x55mm(H)
Weight	0.7kg
Warranty	1 year

Accessories(included)

Serial number	Description	QTY	Picture
1	Main product	**1 pc**	
2	Power adapter	**1 pc**	
3	Chargeable lithium batteries	**2 sets**	
4	Test lead	**1 set**	
5	Pressure module connection cable (only for SPMK517, SPMK518)	**1 pc**	
6	Type compensation conductor (only for SPMK516, SPMK517, SPMK518)	**1 pc**	
7	Dedicated short routes	**20 pcs**	
8	User's manual	**2 pcs**	
9	Calibration test report	**1 pc**	

Optional Accessories

Serial number	Description	Picture
1	SDP pressure module (only for SPMK517, SPMK518)	
2	SDP pressure module test report	
3	CJC assembly (optional K, E, J, T, N, R, S, B, C, D, G, L, U)	