

5 DIGITAL MICRO-PROCESS TEMPERATURE (TC) METER with ALARMS / ANALOG OUTPUT / RS-485

AM5H-T

FEATURES

- Accuracy: $\pm 0.2\%$ F.S. $\pm 0.5^\circ\text{C}$ (Cold junction compensation)
- Measuring Temperature (TC) sensors for K, J, E, R, S, B, T
- High brightness 0.56" LED display range: -19999~99999; 1 decimal point selectable
- $^\circ\text{C}/^\circ\text{F}$ unit selectable
- 1 control output: ON / OFF or proportion programmable / 2 Alarms output / Analog output (15 bit resolution) or RS-485 communication optional (The above options can exist together)
- High stability, non-flammable case (PC), high safety
- CE approval



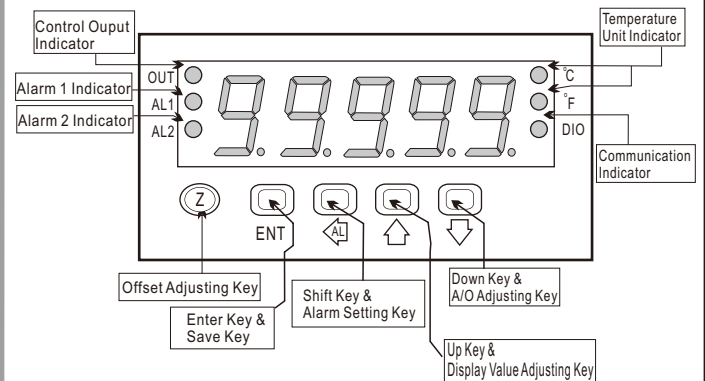
ORDER INFORMATION: AM5H-T - Code 1 - Code 2 - Code 3 Code 4

Code 1	Input Type	Code 2	Aux. Power	Code 3	Alarm Output	Code 4	Output
B	200~1800 $^\circ\text{C}$	A	AC/DC 100~240V	N	None	N	None
E	-185~900 $^\circ\text{C}$	D	AC/DC 22~60V	R1	1 Control	Y	RS-485
J	-200~200 $^\circ\text{C}$			R2	1 Control & 1 Relay	A	4~20 mA
K	-200~1360 $^\circ\text{C}$			R3	1 Control & 2 Relays	V	0~10V
R	0~1760 $^\circ\text{C}$					O	Option
S	0~1750 $^\circ\text{C}$						
T	-200~395 $^\circ\text{C}$						

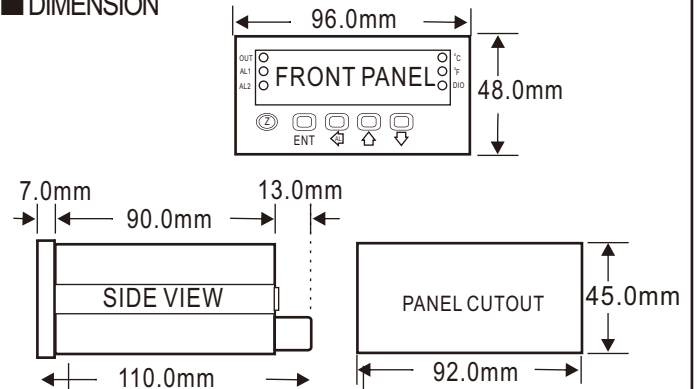
SPECIFICATION

- ◆ Accuracy: $\pm 0.2\%$ F.S. $\pm 0.5^\circ\text{C}$ (Cold junction compensation)
- ◆ Display Screen: High brightness red LED;
- ◆ Sampling Time: 16 cycles / sec
- ◆ Display Range: -19999~99999
- ◆ Zero Adjustment: -19999~99999
- ◆ Over Range Indication: doFL / ioFL or -doFL / -ioFL
- ◆ Polarity Indication: Automatic with "-" indication
- ◆ Disconnection Indication: Automatic with "OPEN" indication
- ◆ Parameters Setting: Push buttons
- ◆ Back Up Memory: EEPROM
- ◆ Alarm Action: " \geq (Hi) on" or "< (Lo) on"
- ◆ Alarm Run Delay Time: 0~99 sec
- ◆ Relay Contact: AC 277V / 7A; DC 30V / 7A
- ◆ Proportion Control Area: 0~999%
- ◆ Proportion Control Time: 0~99 sec
- ◆ Analog Output Resolution: 15 bit
- ◆ Output Response Time: <250 msec (0~90%)
- ◆ Output Capability: Voltage Output: <20mA
Current Output: <10V
- ◆ Communication: RS-485 Modbus RTU mode
- ◆ Baud Rate: 38400 / 19200 / 9600 / 4800 bps
- ◆ Temperature Coefficient: 100ppm / $^\circ\text{C}$ (0~60 $^\circ\text{C}$)
- ◆ Operating Temperature: 0~60 $^\circ\text{C}$
- ◆ Operating Humidity: 20~90% RH (non-condensing)
- ◆ Storage Temperature: -10~70 $^\circ\text{C}$
- ◆ Storage Humidity: 20~90% RH (non-condensing)
- ◆ Power Supply: AC/DC 100~240V; AC/DC 22~60V
- ◆ Power Consumption: 8.5VA (all functions output)
- ◆ Surge Test: 1.5KVac / 1min (Input / Power)

FRONT PANEL & KEY FUNCTIONS

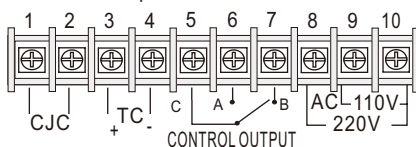


DIMENSION

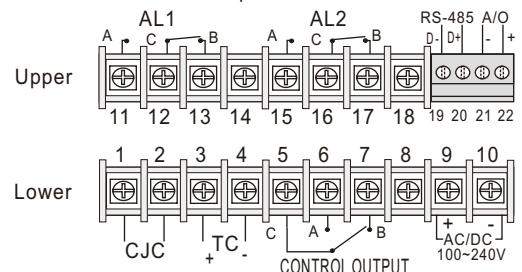


WIRING CONNECTION

1 Alarm Output

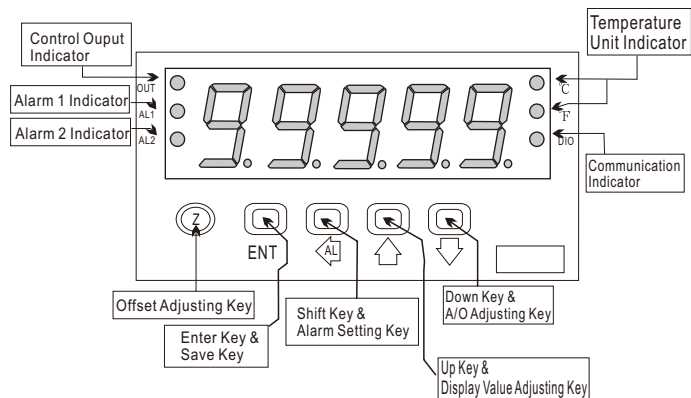


2 Alarms Output



* Please understand key indicators & functions at the first operation.

FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
Offset Adjusting Key	Ⓢ	1. In the measuring page, press this key can enter to offset adjustment.
Enter Key & Save Key	ENT	1. In the measuring status, press this key can enter to parameter pages. 2. In the parameter setting, press this key can save the value & go to next parameter.
Shift Key & Alarm Setting Key	AL	1. In the measuring status, press this key for 3 sec can enter to alarm setting page (The selecting digit will be flashed) 2. In the parameter setting, press this key can move the cursor left.
Up Key & Display Value Adjusting Key	↑	1. In the measuring status, press this key for 3 sec can enter to display value adjustment of "ZERO" & "SPAN" 2. In the parameter setting, press this key can increase the digits.
Down Key & A/O Adjusting Key	↓	1. In the measuring status, press this key for 3 sec can enter to analog output adjustment. 2. In the parameter setting, press this key can decrease the digits.

- **1. The following block charts are parameters codes, parameter codes & parameters will alternate flashing if the parameters can be modified.
- 2. To modify the parameters, please press \leftarrow \uparrow \downarrow , and press **ENT** to save the parameter after the modification.
- 3. Please don't forget the new pass code after modification.
- 4. In any pages, press \uparrow & \downarrow , or don't press any keys for 2 minutes that will back to measuring status.

GENERAL MODE OPERATING PROCEDURES

Block Charts	Display	Descriptions	Default
Power ON		Alarm Setpoint	
10000	10000	Measuring Status	Present value for measurement.
Press \leftarrow for 3 sec	5P	Control Output Setting (S.P)	Press \leftarrow \uparrow \downarrow to modify control output value.
Press ENT	AL1	Alarm 1 Setpoint (AL1)	Press \leftarrow \uparrow \downarrow to modify alarm 1 setpoint.
Press ENT	AL2	Alarm 2 Setpoint (AL2)	Press \leftarrow \uparrow \downarrow to modify alarm 2 setpoint.
Press ENT		Offset Adjustment	
Press Ⓢ	oFSt	Offset Adjustment Setting (oFSt)	Press \leftarrow \uparrow \downarrow to modify offset value.
Press ENT		Display: "ZERO" & "SPAN" Adjustment	
10000	10000	Measuring Status	Present value for measurement.
Press \uparrow for 3 sec	dPEro	Display Zero Adjustment (dZEro)	Press \leftarrow to select adjusting speed rate, press \uparrow \downarrow to modify the zero value. PS: To use this function to adjust the real zero value.
Press ENT	dSPAN	Display Span Adjustment (dSPAN)	Press \leftarrow to select adjusting speed rate, press \uparrow \downarrow to modify the span value. PS: To use this function to adjust the real span value.
Press ENT		Analog Output: "ZERO" & "SPAN" Adjustment	
10000	10000	Measuring Status	The following steps are only available for analog output.
Press \leftarrow for 3 sec	APero	A/O Zero Adjustment (AZero)	Press \leftarrow to select adjusting speed rate, press \uparrow \downarrow to modify the A/O zero. PS: To use this function to adjust the real A/O zero.
Press ENT	ASPA	A/O Span Adjustment (ASPA)	Press \leftarrow to select adjusting speed rate, press \uparrow \downarrow to modify the A/O span. PS: To use this function to adjust the real A/O span.

PROGRAMMING MODE OPERATING PROCEDURES

Block Charts	Display	Descriptions	Default
Power ON		Parameter Group Setting Procedures	
10000	10000	Measuring Status	Present value for measurement.
Press ENT	P.Cod	Pass Code (P.Cod)	Press \leftarrow \uparrow \downarrow to enter pass code.
Press ENT	P.Code Correct	P.Code Correct	Pass code is correct that will enter to parameter groups. Pass code is wrong that will back to measuring status.
NO			
YES	SYS	System Setting Group	
Press \leftarrow	roP	Alarm Setting Group	
Press \leftarrow	RoP or doP	A/O Setting Group	
Press ENT		RS485 Setting Group	

Display	Descriptions	Default
SYS System Setting Page (SYS)	System Setting Group Procedures	
Press: ENT ↓ TYPE Sensor Type Setting (tYPE)	The page shows temperature sensor's type.	Customers specify
Press: ENT ↓ dP Decimal Point Setting (dP)	Press $\uparrow\downarrow$ to select decimal point (0, 1, 2, 3, 4). EX: if the value shows "0.00" that means the decimal point is 2 digits.	Customers specify
Press: ENT ↓ unit Temperature Unit Setting (unit)	Press $\uparrow\downarrow$ to select the units (°C or °F).	Customers specify
Press: ENT ↓ CJC Cold Junction Compensation (CJC)	Press $\uparrow\downarrow$ to switch Cold Junction Compensation ON("no") If setting "YES", the display value would not include the terminal's temperature.	no
Press: ENT ↓ AvG Display Average Setting (AvG)	Press $\leftarrow\uparrow\downarrow$ to modify display average (1~99). when input signal is unstable.	00020
Press: ENT ↓ CodE Pass Code Setting (CodE)	Press $\leftarrow\uparrow\downarrow$ to modify pass code (0~19999). PS: Please don't forget the new pass code after modification.	00000
Press: ENT ↓ LoCK Key Lock Setting (LoCK)	Press $\uparrow\downarrow$ to lock the keys, using key lock function only can view the parameters, but cannot modify any values. PS: no (unlock), YES ("ENT" unlock, others lock).	no
roP Alarm Setting Page (roP)	Alarm Setting Group Procedures	
Press: ENT ↓ ACTt Control Relay Setting (ACTt)	Press $\uparrow\downarrow$ can select control relay action (Hi) or (Lo).	Hi
Press: ENT ↓ ACT1 Alarm 1 (ACT1)	Alarm Action Setting Press $\uparrow\downarrow$ to modify alarm value that is \geq (Hi) or $<$ (Lo) for alarm action.	
Press: ENT ↓ ACT2 Alarm 2 (ACT2)		
Press: ENT ↓ Pb Proportion Control Percentage (P.b)	Press $\leftarrow\uparrow\downarrow$ to modify proportion control percentage(0~999)	00000
Press: ENT ↓ HYS1 Hysteresis 1 (HYS1)	Alarm Hysteresis Setting Press $\leftarrow\uparrow\downarrow$ to modify the value, when alarm runs lower or higher display value (depends on alarm action). Alarm setpoint \pm this value (0~999) will turn off the alarm.	00000
Press: ENT ↓ HYS2 Hysteresis 2 (HYS2)		
Press: ENT ↓ C.tiNE Proportion Time (C.time)	Press $\leftarrow\uparrow\downarrow$ to modify proportion time (0~99 sec).	00000
Press: ENT ↓ dEL1 Delay Time 1 (dEL1)	Alarm Run Delay Setting Press $\leftarrow\uparrow\downarrow$ to modify the value, when the display value reach the alarm value that need to wait for this time (0~99 sec) for alarm action.	00000
Press: ENT ↓ dEL2 Delay Time 2 (dEL2)		

Display	A/O Setting Group Procedures	Default
RoP A/O Setting Page (AoP)	The following steps are only available for analog output.	
Press: ENT ↓ PoLAr A/O Polarity Setting (PoLAr)	Press $\uparrow\downarrow$ to select output for positive or negative pole.	no
Press: ENT ↓ AnLo A/O Low Scale Setting (AnLo)	Press $\leftarrow\uparrow\downarrow$ to adjust A/O low scale to correspond to the display value (programmable). EX: A/O is 0~10V, the display is 10.0 to output 0V, this value must be set for 10.0.	00000
Press: ENT ↓ AnHi A/O Hi Scale Setting (AnHi)	Press $\leftarrow\uparrow\downarrow$ to adjust A/O hi scale to correspond to the display value (programmable). EX: A/O is 0~10V, the display is 90.0 to output 1 0V, this value must be set for 90.0.	99999
doP RS485 Setting Page (doP)	RS485 Setting Group Procedures	
Press: ENT ↓ Addr Address Setting (Addr)	Press $\leftarrow\uparrow\downarrow$ to modify address (0~255).	00000
Press: ENT ↓ bAUd Baud Rate Setting (bAUd)	Press $\uparrow\downarrow$ to select baud rate (38400/19200/9600/4800).	19200
Press: ENT ↓ PAri Parity Setting (PAri)	Press $\uparrow\downarrow$ to select parity (n.8.2/n.8.1/even/odd).	n.8.2

Error Code of Self-Diagnosis	
Display	Descriptions
coFL	Cold junction is over sensor's (PT100) measuring range (0~100 °C).
-coFL	Cold junction is under sensor's (PT100) measuring range (0~100 °C).
oPEn	Input signal or cold junction is disconnection.
doFL	Input signal is over sensor's (T.C) measuring range.
-doFL	Input signal is under sensor's (T.C) measuring range.
E-00	EEPROM reading/writing suffers the interference (about 1 million times).

**Please check the wiring connection is correct first, if the problem still exist, please return the meter to the factory.

- Remark: 1. There are 4 parameter groups of "System Setting Group(SYS)", "Alarm Setting Group(roP)", "Analog Output Setting Group (AoP)" & "RS485 Setting Group(doP)" for modification.
2. Press \leftarrow to select each group page, and press ENT to enter each group or parameter page for modification or saving the parameters.
3. Some of optional functions of parameter pages still exist, but the functions are disable.

Modbus RTU Mode Protocol Address Table

Data: 16Bit / 32Bit, +/- is 8000~7FFF (-32768~32767), 80000000~7FFFFFFF(-2147483648~2147483647)

Modbus	HEX	Name	Descriptions	Act
40001	0000	ID	Model number identification; AM5H-T is "0E"	R
40002	0001	STATUS	Current alarm output & external control input status display; range: 0000~0030 (0~48) (0:OFF, 1:ON) (Bit5: AL2, Bit4: AL1)	R
40003	0002	TYPE	Input type display	R
40004	0003	UNIT	Temperature unit setting; range: 0000~0001 (0~1) 0: °C, 1: °F	
40005	0004	CJC	Cold junction compensation setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40006	0005	LOCK	Key lock setting; range: 0000~0001 (0~1) 0:NO, 1:YES	R/W
40007	0006	ACT	Control Relay act setting; range: 0000~0001 (0~1) 0:HI, 1:LO	R/W
40008	0007	ACT1	Alarm 1 act setting; range: 0000~0001 (0~1) 0:HI, 1:LO	R/W
40009	0008	ACT2	Alarm 2 act setting; range: 0000~0001 (0~1) 0:HI, 1:LO	R/W
40010	0009	DP	Decimal point setting; range: 0000~0004 (0~4) 0:10 ⁰ , 1:10 ⁻¹ ; 2:10 ⁻² ; 3:10 ⁻³ ; 4:10 ⁻⁴	R/W
40011	000A	BAUD	Baud rate setting; range: 0000~0003 (0~3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40012	000B	PARI	Parity setting; range: 0000~0003 (0~3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40013	000C	AVG	Display average setting; range: 0001~0063 (1~99)	R/W
40014	000D	ADDR	Address setting; range: 0000~00FF (0~255)	R/W
40015	000E	PTIME	Proportion control time setting; range: 0000~0063 (0~99)	R/W
40016	000F	DEL1	Alarm 1 act delay time setting; range: 0000~0063 (0~99)	R/W
40017	0010	DEL2	Alarm 2 act delay time setting; range: 0000~0063 (0~99)	R/W
40018	0011	RST	Proportion control area setting; range: 0000~03E7 (0~999)	R/W
40019	0012	HYS1	Alarm 1 hysteresis setting; range: 0000~03E7 (0~999)	R/W
40020	0013	HYS2	Alarm 2 hysteresis setting; range: 0000~03E7 (0~999)	R/W
40021	0014	CODE	Pass code setting; range: 0000~4E1F (0~19999)	R/W
40022	0015	OFST	Temperature off-set setting; range: FC19~03E7 (-999~999)	R/W
40023	0016	OUT	Control output value setting; range: B1E1~4E1F (-19999~19999)	R/W
40024	0017	AL1	Alarm 1 setpoint setting; range: B1E1~4E1F (-19999~19999)	R/W
40025	0018	AL2	Alarm 2 setpoint setting; range: B1E1~4E1F (-19999~19999)	R/W
40026	0019	DISPLAY	Current display; range: B1E1~4E1F (-19999~19999)	R

CALIBRATION OPERATING PROCEDURES

	Display	Descriptions	Default
	Calibration		
	Measuring Status	Present value for measurement Press ENT & together for 3 sec will enter to calibration operating procedures.	
	Input Low Scale Calibration (inLo)	1. Input standard low scale signal. 2. Press to calibrate input low scale.	
	Input Hi Scale Calibration (inHi)	1. Input standard hi scale signal. 2. Press to calibrate input hi scale.	
	System Setting Page(SYS)	1. Finish calibration operating procedures will enter to system setting group. 2. Press & together to back to measuring status.	

Warning: Calibration of this meter requires a standard signal with 0.01% accuracy or better and an external meter with 0.005% accuracy or better.