

5 DIGITAL MICRO-PROCESS RPM / LINE-SPEED / FREQUENCY METER with 2~4 ALARMS / ANALOG OUTPUT / RS-485

AM5H-R

FEATURES

- Accuracy: $\pm 0.03\%$ F.S.
- Measuring AC Frequency / DC Pulse / Magnetic; Input frequency: 0.001Hz~100KHz
- High brightness 0.8" LED display: 0~99999; decimal point selectable
- Line-Speed / RPM / Frequency selectable; Line unit: M, Ft, Y/min selectable
- RPM pulse input programmable: 1~99999
- 2~4 alarms programmable (Hi or Lo) / Analog output (15 bit resolution) / RS-485 communication optional (The above option can exist together)
- High stability, non-flammable case (PC), high safety
- CE approval



ORDER INFORMATION: AM5H-R - [Code 1] [Code 2] - [Code 3] - [Code 4] [Code 5] [Code 6]

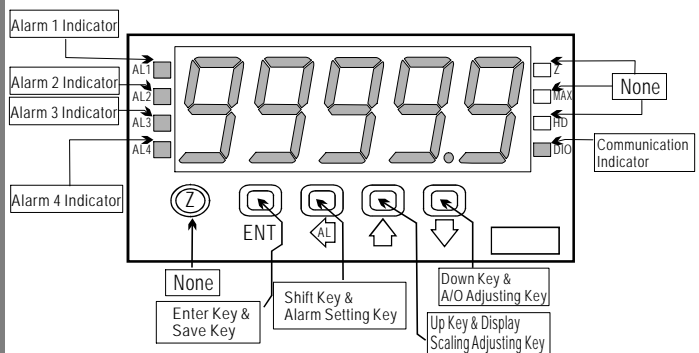
Code 1	Input Signal	Code 1	Input Signal	Code 2	Display Unit	Code 3	Aux. Power	Code 4	Alarm Output	Code 5	Analog Output	Code 6	RS-485
N5	NPN(5V)	VA	AC 2-60V	H	Hz	A	AC/DC 100-240V	N	None	N	None	N	None
N2	NPN(12V)	VB	AC 60-600V	R	RPM	B	DC 12V	R2	2 Relays	A	4-20mA	Y	Yes
P5	PNP(5V)	VC	Pick-up 50mV-1.5V	M	M/min	C	DC 24V	R3	3 Relays	V	0-10V		
P2	PNP(12V)	VD	Pick-up 500mV-15V	Y	Y/min	D	DC 30-90V	R4	4 Relays	O	Option		
CT	Contact	VE	DC 24Vp	F	F/min			O2	2 Open Collect				
		O	Option					O3	3 Open Collect				
								O4	4 Open Collect				

**1: NPN(5V), PNP(5V) offers excitation power DC5V; NPN(12V), PNP(12V) offers excitation power DC12V for sensors using.
2: Please use PNP/NPN(5V/12V) or DC24Vp for DC pulse input.

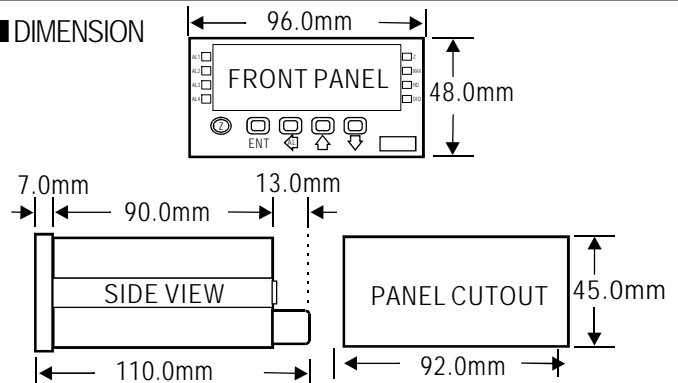
SPECIFICATION

- ◆ Accuracy: $\pm 0.03\%$ F.S.
- ◆ Display Screen: High brightness red LED; 20.3mm(0.8")
- ◆ Sampling Time: 10 cycles / sec: >10Hz
f cycles / sec: <10Hz
- ◆ Display Range: 0-99999
- ◆ Over Range Indication: doFL / ioFL
- ◆ Polarity Indication: Automatic with "-" indication
- ◆ Parameters Setting: Push buttons
- ◆ Back Up Memory: EEPROM
- ◆ Alarm Action: "≥ (Hi) on" or "< (Lo) on"
- ◆ Alarm Run Delay Time: 0-99 sec
- ◆ Relay Contact: AC 277V / 7A; DC 30V / 7A
- ◆ 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 / °C (0~60°C)
- ◆ Operating Temperature: 0~60°C
- ◆ Operating Humidity: 20~90% RH (non-condensing)
- ◆ Storage Temperature: -10~70°C
- ◆ Storage Humidity: 20~90% RH (non-condensing)
- ◆ Power Supply: AC/DC 100~240V; DC 12 / 24 / 30~90V
- ◆ Power Consumption: 8.5VA (all functions output)
- ◆ Surge Test: 1.5KVac / 1min (Input / Power)

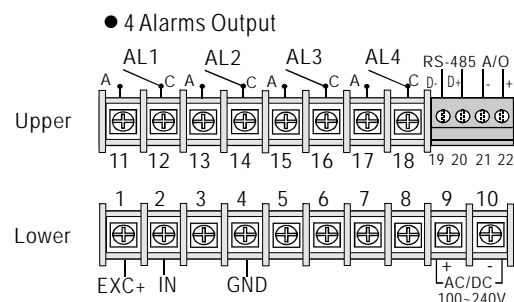
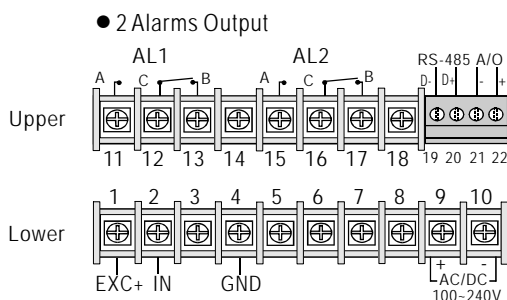
FRONT PANEL & KEY FUNCTIONS



DIMENSION

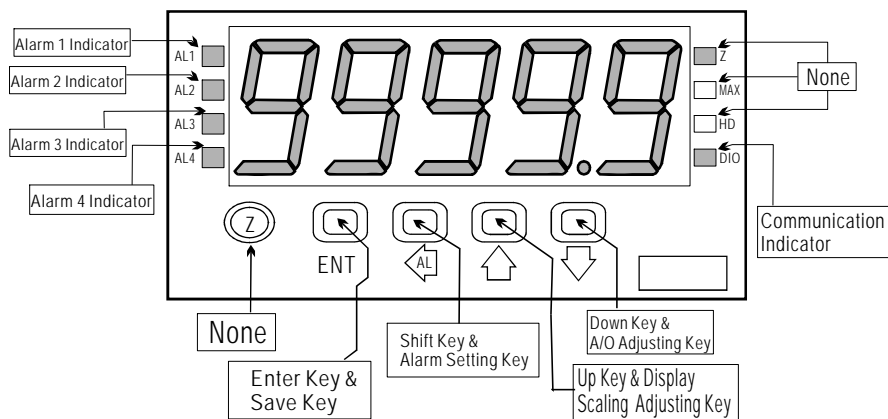


WIRING CONNECTION



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

FRONT PANEL & KEY FUNCTIONS



Key Name	Symbol	Descriptions
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 Scaling Adjusting Key	↑	1. In the measuring status, press this key for 3 sec can enter to display scaling adjustment 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 \rightarrow , 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 \leftarrow & \rightarrow , 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	10000	Measuring Status	Present value for measurement.
Press \leftarrow for 3 sec	AL 1	Alarm 1 Setpoint (AL1)	Press \leftarrow \rightarrow to modify alarm 1 setpoint.
Press ENT	AL 2	Alarm 2 Setpoint (AL2)	Press \leftarrow \rightarrow to modify alarm 2 setpoint.
Press ENT	AL 3	Alarm 3 Setpoint (AL3)	Press \leftarrow \rightarrow to modify alarm 3 setpoint.
Press ENT	AL 4	Alarm 4 Setpoint (AL4)	Press \leftarrow \rightarrow to modify alarm 4 setpoint.
Press ENT			
		Scaling Adjustment	
Power ON	10000	Measuring Status	Present value for measurement.
Press \leftarrow for 3 sec	SCALE	Scale Coefficient Adjustment (SCALE)	Press \leftarrow \rightarrow to modify scale coefficient 1 (0.0001 - 9.9999). PS: 1. In Frequency & RPM types, this coefficient can be modified for display value. (Please refer to Scaling Formula) 2. In Line-Speed type, this coefficient means "diameter" of the roll, the unit will be changed by selecting display unit. EX: If the display unit is "Meter" the diameter is also showed "Meter".
Press ENT			
		Analog Output: "ZERO" & "SPAN" Adjustment	
Power ON	10000	Measuring Status	Present value for measurement.
Press \leftarrow for 3 sec	AZEro	A/O Zero Adjustment (AZEro)	Press \leftarrow to select adjusting speed rate, press \leftarrow \rightarrow to modify the A/O zero. PS: To use this function to adjust the real A/O zero.
Press ENT	ASPA n	A/O Span Adjustment (ASPA n)	Press \leftarrow to select adjusting speed rate, press \leftarrow \rightarrow to modify the A/O span. PS: To use this function to adjust the real A/O span.
Press ENT			

- 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.

PROGRAMMING MODE OPERATING PROCEDURES

Block Charts	Display	Descriptions	Default
Power ON	10000	Measuring Status	Present value for measurement.
Press ENT	P.Cod	Pass Code (P.Cod)	Press \leftarrow \rightarrow to enter pass code.
Press ENT			
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			
Press \leftarrow	SYS (SYS)	System Setting Group	
Press ENT			
Press \leftarrow	roP (roP)	Alarm Setting Group	
Press ENT			
Press \leftarrow	AoP (AoP)	A/O Setting Group	
Press ENT			
Press \leftarrow	doP (doP)	RS485 Setting Group	
Press ENT			

Display	Descriptions	Default
System Setting Group Procedures		
Press ENT → 5YS System Setting Page (SYS)	System Setting Group Procedures	
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 → tYPE Input Type Setting (tYPE)	Press \uparrow \downarrow to modify the input type. (RPM/Linear-Speed/Frequency)	Customers specify
Press ENT → Unit Line-Speed Unit Setting (Unit)	Press \uparrow \downarrow to modify the unit of line-speed (Meter/Foot/Yard). PS: Line-Speed type available	Customers specify
Press ENT → PPr PPR Setting (PPr)	Press \leftarrow \uparrow \downarrow to modify ppr (1-99999).	00001
Press ENT → tbASE Sampling Time Base (tbASE)	Press \leftarrow \uparrow \downarrow to modify sampling time base (0.1-999.9 sec).	00001
Press ENT → AvG Display Average Setting (AvG)	Press \leftarrow \uparrow \downarrow to modify display average (1-99). PS: Please use this function for stable display value when input signal is unstable.	00005
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
Alarm Setting Group Procedures		
Press ENT → roP Alarm Setting Page (roP)	The following steps are only available for alarm output.	
Press ENT → ACt1 Alarm 1 (AC1)	Alarm Action Setting Press \uparrow \downarrow to modify alarm value that is \geq (Hi) or $<$ (Lo) for alarm action. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.	Hi
Press ENT → ACt2 Alarm 2 (AC2)		
Press ENT → ACt3 Alarm 3 (AC3)		
Press ENT → ACt4 Alarm 4 (AC4)		
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. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.	00000
Press ENT → HYS2 Hysteresis 2 (HYS2)		
Press ENT → HYS3 Hysteresis 3 (HYS3)		
Press ENT → HYS4 Hysteresis 4 (HYS4)		
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. PS: 1. There are 4 alarms output optional. 2. This page is exist without alarm output, but the function will be disabled. 3. Press ENT to save the value and go to the next parameter.	00000
Press ENT → dEL2 Delay Time 2 (dEL2)		
Press ENT → dEL3 Delay Time 3 (dEL3)		
Press ENT → dEL4 Delay Time 4 (dEL4)		

Display	Descriptions	Default
A/O Setting Group Procedures		
Press ENT → 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. PS: Voltage output, NO: positive pole output (0~+10V) YES: positive & negative pole output (-10~+10V)	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. 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. EX: A/O is 0-10V, the display is 90.0 to output 10V, this value must be set for 90.0.	99999
RS485 Setting Group Procedures		
Press ENT → doP RS485 Setting Page (doP)	The following steps are only available for RS-485.	
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).	n8.2
Press ENT → FrAmE Frame Setting (FrAmE)	Press \uparrow \downarrow to select frame type. (NO:Hi \rightarrow Lo, YES:Lo \rightarrow Hi)	no

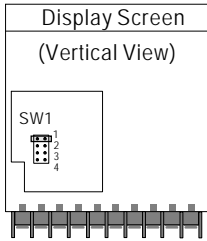
Error Code of Self-Diagnosis

Display	Descriptions
1 oFL	Input signal is over input range (0-100KHz).
doFL	Input signal is over display range (99999).
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.

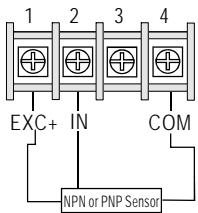
Input Signal Modification

**To Select the pin to modify the input signal for different sensors.
PS: In dual input type, excitation power must be the same.



SW1	JUMPER	DEFINITION
	1	Open: 12V; Close: 5V
	2	Open: 100KHz; Close: 100Hz
	3	Open: NPN; Close: PNP
	4	Open: PNP; Close: NPN

**Connection:



NPN (5V): 0~100 Hz

JUMPER	SW1/SW2
1	
2	
3	
4	

NPN (5V): 0~100 KHz

JUMPER	SW1/SW2
1	
2	
3	
4	

NPN (12V): 0~100 Hz

JUMPER	SW1/SW2
1	
2	
3	
4	

NPN (12V): 0~100 KHz

JUMPER	SW1/SW2
1	
2	
3	
4	

PNP (5V): 0~100 Hz

JUMPER	SW1/SW2
1	
2	
3	
4	

PNP (5V): 0~100 KHz

JUMPER	SW1/SW2
1	
2	
3	
4	

PNP (12V): 0~100 Hz

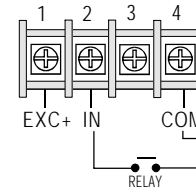
JUMPER	SW1/SW2
1	
2	
3	
4	

PNP (12V): 0~100 KHz

JUMPER	SW1/SW2
1	
2	
3	
4	

**Connection:

Relay Contact: NPN 0-100 Hz



JUMPER	SW1/SW2
1	
2	
3	
4	

**For relay input type, please select NPN 0- 100 Hz.

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-R is "01"	R
40002	0001	STATUS	Current alarm output status display; range: 0000-00F0 (0-240) (0:OFF, 1:ON) (Bit7:AL4, Bit6: AL3, Bit5: AL2, Bit4: AL1)	R
40003	0002	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
40004	0003	TYPE	Input type setting; range: 0000-0002 (0-2) 0:RPM, 1:Linear-Speed, 2:Frequency	R/W
40005	0004	UNIT	Linear-Speed unit setting; range: 0000-0002 (0-2) 0:Meter, 1:Foot, 2:Yard	R/W
40006	0005	LOCK	Key lock setting; range: 0000-0001 (0-1) 0:NO, 1:YES	R/W
40007	0006	FRAME	Frame setting; range 0000-0001(0-1) 0:NO, 1:YES	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	ACT3	Alarm 3 act setting; range 0000-0001(0-1) 0:Hi, 1:Lo	R/W
40011	000A	ACT4	Alarm 4 act setting; range 0000-0001(0-1) 0:Hi, 1:Lo	R/W
40012	000B	BAUD	Baud rate setting; range: 0000-0003 (0-3) 0:38400, 1:19200, 2:9600, 3:4800	R/W
40013	000C	PARI	Parity setting; range: 0000-0003 (0-3), 0:N.8.2., 1:N.8.1., 2:EVEN, 3:ODD	R/W
40014	000D	POLAR	Analog output polarity setting; range: 0000-0001 (0-1) 0:NO, 1:YES	R/W
40015	000E	AVG	Display average setting; range: 0001-0063 (1-99)	R/W
40016	000F	ADDR	Address setting; range: 0000-00FF (0-255)	R/W
40017	0010	DEL1	Alarm 1 act delay time setting; range: 0000-0063 (0-99)	R/W
40018	0011	DEL2	Alarm 2 act delay time setting; range: 0000-0063 (0-99)	R/W
40019	0012	DEL3	Alarm 3 act delay time setting; range: 0000-0063 (0-99)	R/W
40020	0013	DEL4	Alarm 4 act delay time setting; range: 0000-0063 (0-99)	R/W
40021	0014	TBASE	Sampling time base setting; range: 0001-270F (1-9999)	R/W
40022	0015	HYS1	Alarm 1 hysteresis setting; range: 0000-270F (0-9999)	R/W
40023	0016	HYS2	Alarm 2 hysteresis setting; range: 0000-270F (0-9999)	R/W
40024	0017	HYS3	Alarm 3 hysteresis setting; range: 0000-270F (0-9999)	R/W
40025	0018	HYS4	Alarm 4 hysteresis setting; range: 0000-270F (0-9999)	R/W
40026	0019	AZERO	Analog output zero setting; range: D8F1-270F (-9999-9999)	R/W
40027	001A	ASPAN	Analog output span setting; range: D8F1-270F (-9999-9999)	R/W
40028	001B	CODE	Pass code setting; range: 0000-4E1F (0-19999)	R/W
40029	001C	PPR	PPR setting; range: 00000001-0001869F (0-199999) Hi Bit	R/W
40030	001D		PPR setting; range: 00000001-0001869F (0-199999) Low Bit	R/W
40031	001E	SCALE	Display scaling setting; range: 00000001-0001869F (0-199999) Hi Bit	R/W
40032	001F		Display scaling setting; range: 00000001-0001869F (0-199999) Low Bit	R/W
40033	0020	AL1	Alarm 1 setpoint setting; range: 00000000-0001869F(0-99999) Hi Bit	R/W
40034	0021		Alarm 1 setpoint setting; range: 00000000-0001869F(0-99999) Low Bit	R/W

Modbus	HEX	Name	Descriptions	Act
40035	0022	AL2	Alarm 2 setpoint setting; range: 00000000-0001869F(0-99999) Hi Bit	R/W
40036	0023		Alarm 2 setpoint setting; range: 00000000-0001869F(0-99999) Low Bit	R/W
40037	0024	AL3	Alarm 3 setpoint setting; range: 00000000-0001869F(0-99999) Hi Bit	R/W
40038	0025		Alarm 3 setpoint setting; range: 00000000-0001869F(0-99999) Low Bit	R/W
40039	0026	AL4	Alarm 4 setpoint setting; range: 00000000-0001869F(0-99999) Hi Bit	R/W
40040	0027		Alarm 4 setpoint setting; range: 00000000-0001869F(0-99999) Low Bit	R/W
40041	0028	ANLO	Analog output low scale setting; range: 00000000-0001869F (0-99999) Hi Bit	R/W
40042	0029		Analog output low scale setting; range: 00000000-0001869F (0-99999) Low Bit	R/W
40043	002A	ANHI	Analog output hi scale setting; range: 00000000-0001869F (0-99999) Hi Bit	R/W
40044	002B		Analog output hi scale setting; range: 00000000-0001869F (0-99999) Low Bit	R/W
40045	002C	DISPLAY	Current display; range: 00000000-0001869F (0-99999) Hi Bit	R
40046	002D		Current display; range: 00000000-0001869F (0-99999) Low Bit	R