SS-5300

Humidity & Temperature Transmitter

Temperature sensor(PT100Ω) & For indoor, Duct type Temperature/Humidity transducer. More convenient and reliable control in various environments.

Features

- **Small and compact design**
- **Built-in high sensitivity temp./Humidity sensor**
- **Various output mode :**
  DC4-20mA, 1-5VDC, RS485(MODBUS RTU)
- **Wide range of temp./Humidity measurement :**
  -19.9 ~ 60.0°C / 0.0 ~ 99.9%RH
- **Communication speed 115200bps**
- **Low hysteresis**
- **Quilc response**

Ordering Codes

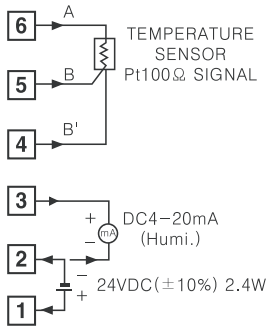
SS - 5300 – 1

1	Temp (Pt100Ω)
2	Temp (Pt100Ω)
	Humidit (DC4–20mA)
3	Temp / Humidit (DC4–20mA)
4	Temp / Humidit(RS 485)

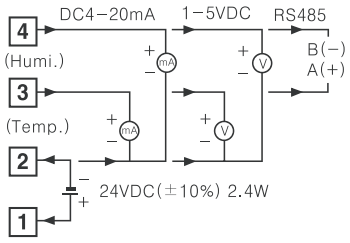
SS–5300	Temperature / Humidity

Connections

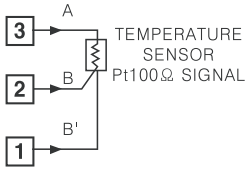
●SS-5300-2



●SS-5300-3, 4



●SS-5300-1



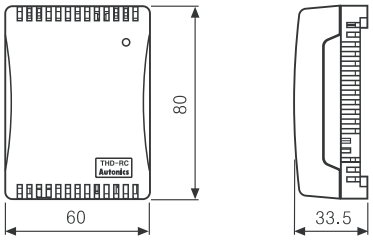
※Please connect checking terminal connection with care of the power.

Specifications

Model		SS–5300–1	SS–5300–2	SS–5300–3	SS–5300–4
		——	24VDC		
Allowable voltage range		——	90~110% of Power supply		
Power consumption		——	less 2.4W		
Input specification		Temperature, Humidity (Internal)			
Output specification	Tem'p			DC4–20mA	RS485
	Humidity	——	DC4–20mA		
Measurement Range	Tem'p	0 ~ 50℃			
	Humidity	——	0 ~ 90%RH		
Output Accuracy	Tem'p	±0.8℃(0 ~ 50℃)		±0.8℃ (5 ~ 40℃)	±0.5℃ (5 ~ 40℃)
	Humidity	——	10~90%RH to less ±3% PH(When 25~45℃)		
Sampling Cycle		——	Fixed 0.5sec		
Isolation Resistance		——	100MΩ (500VDC Standard)		
Voltage resistance		——	500VAC 50/ 60Hz during a minuite		
Noise resistance		——	±0.3kv the square ware noise (pluse width : 1㎲) by the noise simulator		
Vibration	Shock	——	0.75mm amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 10 hours		
	Fauit operation	——	0.5mm amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 10 hours		
Shock	Shock	——	300㎧² (30G) in each of X, Y, Z directions for 3 times		
	Fauit operation	——	100㎧² (10G) in each of X, Y, Z directions for 3 times		
Amibient resistance		0~50℃(Non-Volatile semiconductor memory)			
Storage temperature		-10~60℃(Non-Volatile semiconductor memory)			
Amibient humidity		90%RH			
Weight		Approx. 55g			

Dimensions

(Unit:mm)



※The above specifications are changeable without notice anytime.

Functions

▣ Current output

It transmits current temperature/humidity to other equipments, PC and recorder, and outputs 4–20mADC. It outputs 4mADC at 0℃ of temperature and 0%RH of humidity,20mADC on the 50℃ of temperature and 100%RH of humidity.
※Temperature output and humidity output are divided with 4000 division for resolution.

▣ Voltage output

It transmits current temperature/humidity to other equipments, PC and recorder, and outputs 1–5VDC. It outputs 1VDC on the 0℃ of temperature and 0%RH of humidity. And it outputs 5VDC on the 50℃ of temperature and 100%RH of humidity.
Temperature output and humidity output are divided with 4,000 division for resolution.

▣ Temp. sensor output(Pt 100Ω output)

It transmits current temperature/humidity to other equipments, recorder or thermometer.
It outputs 100Ω at 0℃ and 119.40Ω(123.25Ω) at 50℃(or 60℃). (TCR=3850 ppm/℃)

▣ RS485 communication output

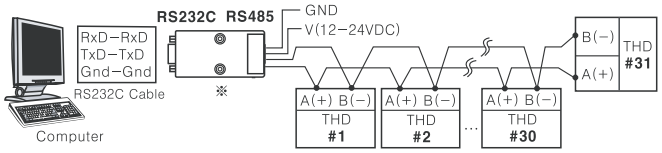
It is used to transmit current temperature and humidity to other equipment.

●Interface

Standard	EIA RS485
Maximum connections	31(Address setting:01~31)
Communication method	2-wire half duplex
Communication type	Asynchronous
Effective communication distance	Max. 800m
Communication speed	1200~115200bps(Setting)
Start bit	1(Fixed)
Stop bit	1(Fixed)
Parity bit	None(Fixed)
Data bit	8bit(Fixed)
Protocol	MODBUS RTU

※During the communication operation between THD and upper system, editing the para-meter is unavailable.
※Correct the parameter of THD communication to be same as upper system.
※It is not allowed to set overlapping communication address at the same communication line.
※Please use a proper twist pair for RS485 communication.

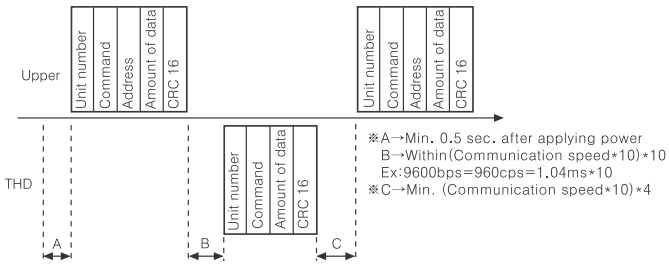
●Application of system organization



※SCM-38I made by Autonics is recommended to use with RS232C to RS485 converter.

●Communication control ordering

1. The communication method is MODBUS RTU(PI-MBUS-300 REV.J).
2. After 0.5sec. being supplied the power into upper system, then able to start communication.
3. The initial communication will be started by upper system.
   When command come out from upper system then THD will response.



●Communication command and block

The format of query and response

Query

Unit number	Command	Start address	Amount of data	CRC16

Calculation range of CRC16

①Unit number :
This code is the upper system can discern THD and able to set within range of 01 to 1F.
②Command : Read command for input register
③Start address : Start address of the input register to read, this device can choose the start address as 0000 and 0001. 16bit data in the address 0000 indicates temperature value, 0001 indicates humidity value. (See MODBUS Mapping table)
④Amount of data : The number of 16bit data from start address (No. of points)
Reading one of 16bit data is available when start address is 0000 : reading two of 16bit data is available when start address is 0001.
⑤CRC16 : CRC16 is for more reliable transmit/receive to check the error between transmitter and receiver.

Response

Unit number	Command	Amount of data	Temperature data	Humidity data	CRC16

Calculation range of CRC16

①Unit number : Distinguish THD and the number is available from 01 to 1F.
②Response command:
A response for read command of input register(See Modbus Mapping Table)
③Amount of data : The number of 16bit data on start code. (No. of Points)
Reading 4 of 8bit data is available when start address is 0000:reading two of 8 bit data is available when start address is 0001. (See MODBUS Mapping Table)
④Temperature data : To get a current temperature value, divide read value by 100
Ex)When read data is 0x09B6, decimal value is 2486, the current value is 2486/100=24.86℃.
⑤Humidity data : To get a current humidity value, divide read value by 100
Ex)When read data is 0x12FE, decimal value is 4862, the current value is 2486/100=48.62%Rh.
⑥CRC16:Check the whole frame.

●Application for communication command

(Query) : Unit number(01), Start code(0000), The number of read data, 16bit(2) Check sum(0x71CB)

01	04	00	00	00	02	71	CB
Unit number	Command	Start code		Amount of data		CRC16	
		High	Low	High	Low	High	Low

(Response) : Unit number(01), The number of read data, 8bit(4), Temperature(0x09B6), Humidity(0x12FE), CRC Check sum(0x94DE)

01	04	04	09	B6	12	FE	94	DE
Unit number	Reponse command	Amount of data	Temperature data		Humidity data		CRC16	
			High	Low	High	Low	High	Low

●Error handling(Slave → Master)

1. Non support command

01	81	01	81	90
Unit number	Response command	Exception code	CRC16	

※Set a received the highest bit and send it to response command and exception code 01.

2. A start code of queried data is inconsistent with the transmittable code.

01	81	02	81	90
Unit number	Response command	Exception code	CRC16	

※Set a received the highest bit and send it to response command and exception code 02.

3. Amount of queried data is inconsistent with a transmittable one.

01	84	03	X	X
Unit number	Response command	Exception code	CRC16	

※Set a received the highest bit and send it to response command and exception code 04.

4. Abnormal operation for command

01	84	04	X	X
Unit number	Response command	Exception code	CRC16	

※Set a received the highest bit and send it to response command and exception code 04.

●MODBUS Mapping Table

Address	Item	Remark
30001(0000)	Temperature value	Temperature value *0.01
30002(0001)	Humidity value	Humidity value *0.01

●Setting a communication speed

1. Set SW1 to 0 and apply power.
2. Operation indicator LED is flickering.
3. Set a communication speed after choosing SW1 within the range 1~8, and hold it for 3sec.
4. After setting a communication speed, LED will be ON. At the moment turn OFF the power.
5. Factory default is 9600bps.

※Setting table for communication speed

SW1	Communication speed(BPS)
1	1200
2	2400
3	4800
4	9600
5	19200
6	38400
7	57600
8	115200

●Set a 485 communication unit no.(01~31)

1. Set SW1 within 1~F and apply power.
2. Unit number is set automatically and it operates with 485 communication mode.
3. Factory default is 01.

※Setting table for unit number

CAL contact	SW1	Unit no.	CAL contact	SW1	Unit no.	CAL contact	SW1	Unit no.
OPEN	1	01	OPEN	D	13	SHORT	9	25
OPEN	2	02	OPEN	E	14	SHORT	A	26
OPEN	3	03	OPEN	F	15	SHORT	B	27
OPEN	4	04	SHORT	0	16	SHORT	C	28
OPEN	5	05	SHORT	1	17	SHORT	D	29
OPEN	6	06	SHORT	2	18	SHORT	E	30
OPEN	7	07	SHORT	3	19	SHORT	F	31
OPEN	8	08	SHORT	4	20			
OPEN	9	09	SHORT	5	21			
OPEN	A	10	SHORT	6	22			
OPEN	B	11	SHORT	7	23			
OPEN	C	12	SHORT	8	24			