

# Indoor Humidity and Temperature Transmitter TS81/TS81A

**Taishio**



## FEATURES

Excellent quality and stable measurement  
1-point user adjustment  
Analogue output and RS485  
MODBUS RTU protocol with integer and floating type  
Unit support metric or imperial  
Configure adapter support  
Transistor output with PNP or NPN connection  
LCD display plus 3 capacitive buttons

## Humidity

Measurement range 0 ... 95 %RH  
Accuracy (including non-linearity, hysteresis, and repeatability)  
TS81A 2%RH@25°C (20 ... 80%RH)  
±3%RH@25°C (0 ... 20/80 ... 100%RH)  
TS81 ±3%RH@25°C (20 ... 80%RH)  
Temperature coefficient (from 0°C to 80°C)  
typ. ±0.02%RH/°C  
Humidity Hysteresis ±1%RH  
Recovery time after 150 hours of condensation 10 second  
Long term drift < 0.25%RH/year  
Response Time (at 63% of signal) from 33 to 75%RH  
10 second (at 1m/s air flow)

## Temperature

Measurement range -20 ... 80 °C  
Accuracy (including non-linearity, hysteresis, and repeatability) ±0.4°C  
Long term drift < 0.02°C/year  
Response Time (at 63% of signal) from 15°C to 45°C  
1 minute (at 1m/s air flow)

## Analog outputs

Current version 2-wire / 3-wire, 4 ... 20 mA  
Voltage version 3-wire, 0 ... 1 V / 5 V / 10 V  
Accuracy of analog outputs at +25 °C ±0.1% full scale  
Temperature dependence ±0.005%/°C full scale  
External loads current output RL < 500 ohm  
voltage output 0 ... 1 V output RL > 2 kohm  
0 ... 5 V and 0 ... 10 V outputs RL > 10 kohm

## RS485 output with Modbus RTU

(2-wire 4...20mA no support)  
ID 1...247  
Baud rate 9600/19200/38400/57600/115200  
Data format N81/N82/E81/E82/O81/O82

## Psychometric calculations (option)

(Td) dew point temperature, (Tf) frost point temperature,  
(R) mixing ratio, (A) absolute humidity, (S) enthalpy,  
(Tw) wet bulb temperature, (E) water vapor pressure

## Display with touch button (option)

LCD 128x64 dots without backlight  
Lines 1,2 or 3  
Buttons capacitive \*3

## Transistor output (option)

Isolation Yes  
Current maximum 50 mA sink / source  
Voltage maximum 30VDC  
Connection PNP/NPN  
Activate Increasing / Decreasing  
Set-point -9999 to 9999  
Hysteresis 0 to 9999  
Delay 0 to 3600 second  
Latch on/off

## Power supply

2-wire 4...20mA 11 ... 35 VDC  
3-wire 4...20mA/voltage/RS485 15 ... 35 VDC  
or 12 ... 29 VAC

## Power consume (25 °C, V+ 24 VDC)

2-wire 4...20mA max. 40mA  
3-wire 4...20mA max. 30mA  
Voltage/RS485 typ. 10mA

## Mechanics

Housing material ABS  
Housing classification IP20  
Connection AWG 12...24

## Temperature range

without display -20 ... 80 °C (-4 ... 176 °F)  
with display -20 ... 70 °C (-4 ... 158 °F)

## Electromagnetic compatibility

Complies with EMC standard  
EN61326-1, Industrial Environment

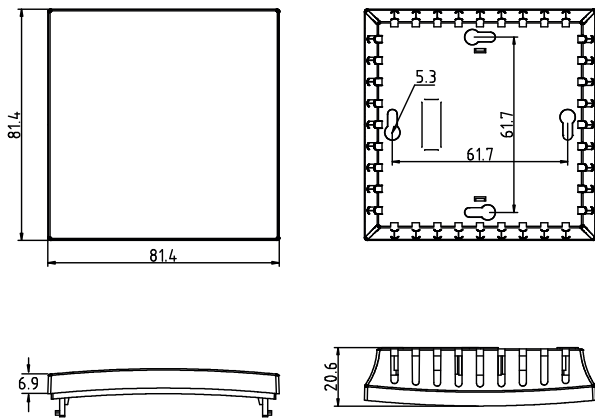
## Metric

## Imperial

Temperature <u>T</u>	-20 ... 80 °C	-4 ... 176 °F
Relative Humidity <u>RH</u>	0 ... 100 %	0 ... 100 %
Dew point <u>Td</u>	-20 ... 80 °C	-4 ... 176 °F
Frost/dew point <u>Tf</u>	-20 ... 80 °C	-4 ... 176 °F
Wet bulb temperature <u>Tw</u>	-20 ... 80 °C	-4 ... 176 °F
water vapor pressure <u>E</u>	0 ... 1013 mbar	0 ... 14.7 psi
Mixing ratio <u>R</u>	0 ... 30000 g/kg	0 ... 210000 gr/lb
Absolute humidity <u>A</u>	0 ... 550 g/m <sup>3</sup>	0 ... 240 gr/ft <sup>3</sup>
Enthalpy <u>S</u>	-20 ... 40000 kJ/kg	-1 ... 20000 BTU/lb

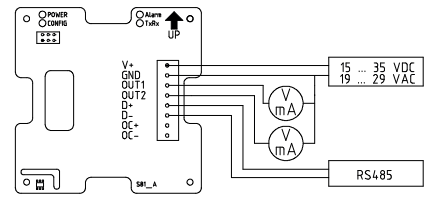
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## DIMENSIONS (mm)

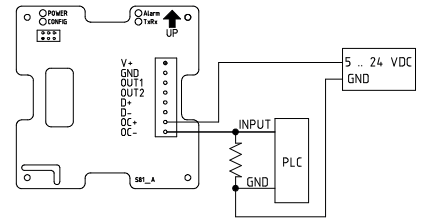


## 3-WIRE CONNECTION DIAGRAM

4...20mA  
0...1/5/10V  
RS485

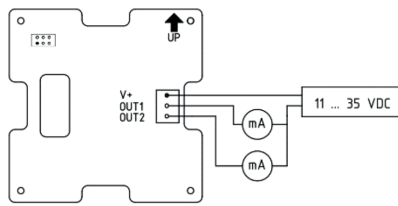


PLC PNP

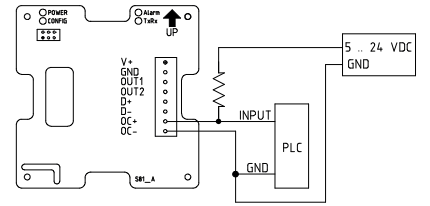


## 2-WIRE CONNECTION DIAGRAM

4...20mA



PLC NPN



## Ordering Guide

Model	Output	Temperature Scale	Psychometric calculations (Option)	LCD Display with touch buttons (Option)	Transistor Output (Option)
TS81A	2-wire 4...20mA* (1)	0...50°C (1)	Yes (M)	Yes (D)	Yes (R)
TS81	3-wire 4...20mA (2)	0...100°C (2)			
	0 ... 10V (3)	By order (S)			
	0 ... 5V (5)	None (X)			
	0 ... 1V (6)				

\*2-wire 4...20mA no support RS485 output

118 to 86 adapter	
86 wall mounting	

Configure adapter	
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