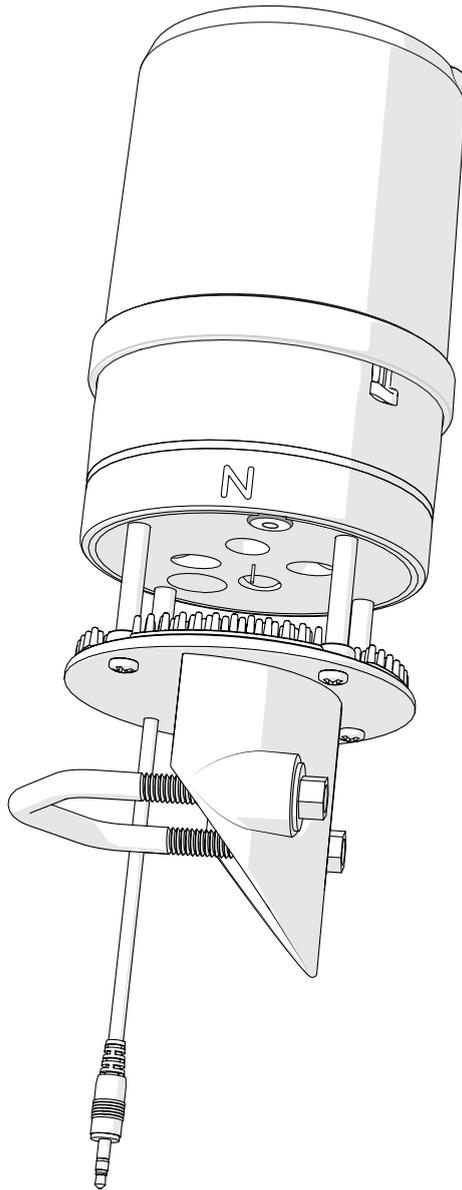




**METER**

# **ATMOS 41**

**Datasheet**



# 1. INTRODUCTION

Thank you for choosing the ATMOS 41 All-in-One Weather Station from METER Group.

The ATMOS 41 All-in-One Weather Station is designed for continuous monitoring of environmental variables, including all standard weather measurements ([Section 3](#)). The ATMOS 41 measures the following:

- Solar radiation
- Precipitation
- Air temperature
- Barometric pressure
- Vapor pressure
- Relative humidity
- Wind speed
- Wind direction
- Maximum wind gust
- Lightning strikes
- Lightning distance
- Tilt

All sensors are integrated into a single, small form-factor unit, requiring minimal installation effort. A robust, no moving parts design that prevents errors because of wear or fouling make the weather station ideal for long-term, remote installations. ATMOS 41 can be used for a variety of applications:

- Weather monitoring
- Microenvironment monitoring
- Spatially-distributed environmental monitoring
- Crop weather monitoring
- Fire danger monitoring
- Weather networks

Additional advantages include its low-power design that supports battery-operated data loggers and the SDI-12 three-wire interface. A tilt sensor warns the user of out-of-level condition, and no configurations are necessary.

Prior to use, verify all ATMOS 41 system components are included and appear in good condition.

### 3. SYSTEM

This section describes the ATMOS 41 All-in-One Weather Station system.

#### 3.1 SPECIFICATIONS

##### MEASUREMENT SPECIFICATIONS

Solar Radiation	
Range	0–1750 W/m <sup>2</sup>
Resolution	1 W/m <sup>2</sup>
Accuracy	±5% of measurement typical
Precipitation	
Range	0–400 mm/h
Resolution	0.017 mm
Accuracy	±5% of measurement from 0 to 50 mm/h
Vapor Pressure	
Range	0–47 kPa
Resolution	0.01 kPa
Accuracy	Varies with temperature and humidity, ±0.2 kPa typical below 40 °C

100%	± 0.05	± 0.09	± 0.16	± 0.29	± 0.49	± 0.81	± 1.30	± 2.62	± 6.32
95%	± 0.05	± 0.09	± 0.14	± 0.24	± 0.41	± 0.68	± 1.08	± 2.26	± 5.27
90%	± 0.05	± 0.07	± 0.09	± 0.15	± 0.33	± 0.54	± 1.06	± 2.23	± 5.20
85%	± 0.05	± 0.07	± 0.08	± 0.15	± 0.33	± 0.53	± 1.05	± 2.19	± 5.13
80%	± 0.04	± 0.07	± 0.08	± 0.15	± 0.32	± 0.53	± 0.83	± 1.84	± 4.07
75%	± 0.04	± 0.07	± 0.08	± 0.14	± 0.31	± 0.52	± 0.82	± 1.80	± 4.00
70%	± 0.04	± 0.07	± 0.08	± 0.14	± 0.31	± 0.51	± 0.81	± 1.77	± 3.93
65%	± 0.04	± 0.07	± 0.08	± 0.13	± 0.30	± 0.50	± 0.79	± 1.73	± 3.86
60%	± 0.04	± 0.05	± 0.07	± 0.13	± 0.22	± 0.36	± 0.57	± 1.38	± 3.30
55%	± 0.04	± 0.04	± 0.07	± 0.13	± 0.22	± 0.35	± 0.56	± 1.34	± 3.23
50%	± 0.03	± 0.04	± 0.07	± 0.12	± 0.21	± 0.34	± 0.55	± 1.31	± 3.16
45%	± 0.03	± 0.04	± 0.07	± 0.12	± 0.20	± 0.33	± 0.53	± 1.27	± 2.60
40%	± 0.03	± 0.03	± 0.07	± 0.12	± 0.20	± 0.33	± 0.52	± 1.24	± 2.53
35%	± 0.03	± 0.05	± 0.06	± 0.11	± 0.19	± 0.32	± 0.50	± 1.20	± 2.46
30%	± 0.03	± 0.05	± 0.06	± 0.11	± 0.19	± 0.31	± 0.49	± 1.17	± 2.39
25%	± 0.03	± 0.04	± 0.06	± 0.10	± 0.18	± 0.30	± 0.48	± 1.14	± 2.32
20%	± 0.03	± 0.06	± 0.06	± 0.10	± 0.25	± 0.41	± 0.67	± 1.10	± 2.25
15%	± 0.03	± 0.05	± 0.05	± 0.10	± 0.24	± 0.40	± 0.85	± 1.39	± 2.67
10%	± 0.05	± 0.07	± 0.08	± 0.14	± 0.31	± 0.52	± 0.84	± 1.67	± 4.08
5%	± 0.05	± 0.10	± 0.12	± 0.22	± 0.38	± 0.64	± 1.03	± 1.96	± 5.00
0%	± 0.08	± 0.15	± 0.12	± 0.22	± 0.45	± 0.75	± 1.22	± 3.21	± 5.92
	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C

Figure 4 Vapor pressure sensor accuracy

## SYSTEM

Relative Humidity	
Range	0–100% RH
Resolution	0.1% RH
Accuracy	Varies with temperature and humidity, $\pm 3\%$ RH typical

HUMIDITY (%RH)	100%	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$	$\pm 6\%$	$\pm 10\%$
	95%	$\pm 5\%$	$\pm 5\%$	$\pm 4\%$	$\pm 5\%$	$\pm 8\%$				
	90%	$\pm 5\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 5\%$	$\pm 8\%$
	85%	$\pm 5\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 5\%$	$\pm 8\%$
	80%	$\pm 4\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 6\%$
	75%	$\pm 4\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 6\%$
	70%	$\pm 4\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 6\%$
	65%	$\pm 4\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 6\%$
	60%	$\pm 4\%$	$\pm 3\%$	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$				
	55%	$\pm 4\%$	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$					
	50%	$\pm 4\%$	$\pm 2\%$	$\pm 3\%$	$\pm 5\%$					
	45%	$\pm 4\%$	$\pm 2\%$	$\pm 3\%$	$\pm 4\%$					
	40%	$\pm 4\%$	$\pm 2\%$	$\pm 3\%$	$\pm 4\%$					
35%	$\pm 4\%$	$\pm 3\%$	$\pm 2\%$	$\pm 3\%$	$\pm 4\%$					
30%	$\pm 4\%$	$\pm 3\%$	$\pm 2\%$	$\pm 3\%$	$\pm 4\%$					
25%	$\pm 4\%$	$\pm 3\%$	$\pm 2\%$	$\pm 3\%$	$\pm 4\%$					
20%	$\pm 4\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	
15%	$\pm 5\%$	$\pm 4\%$	$\pm 2\%$	$\pm 2\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 4\%$	$\pm 5\%$	
10%	$\pm 8\%$	$\pm 5\%$	$\pm 3\%$	$\pm 3\%$	$\pm 4\%$	$\pm 4\%$	$\pm 4\%$	$\pm 5\%$	$\pm 8\%$	
5%	$\pm 8\%$	$\pm 8\%$	$\pm 5\%$	$\pm 6\%$	$\pm 10\%$					
0%	$\pm 12\%$	$\pm 12\%$	$\pm 5\%$	$\pm 5\%$	$\pm 6\%$	$\pm 6\%$	$\pm 6\%$	$\pm 10\%$	$\pm 12\%$	
	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	
	TEMPERATURE (°C)									

Figure 5 RH sensor accuracy

Air Temperature	
Range	-50 to 60 °C
Resolution	0.1 °C
Accuracy	$\pm 0.6$ °C

Humidity Sensor Temperature	
Range	-40 to 50 °C
Resolution	0.1 °C
Accuracy	$\pm 1.0$ °C

Barometric Pressure	
Range	50–110 kPa
Resolution	0.01 kPa
Accuracy	$\pm 0.1$ kPa from -10 to 50 °C $\pm 0.5$ kPa from -40 to 60 °C

**Horizontal Wind Speed**

Range	0–30 m/s
Resolution	0.01 m/s
Accuracy	The greater of 0.3 m/s or 3% of measurement

**Wind Gust**

Range	0–30 m/s
Resolution	0.01 m/s
Accuracy	The greater of 0.3 m/s or 3% of measurement

**Wind Direction**

Range	0°–359°
Resolution	1°
Accuracy	±5°

**Tilt**

Range	–90° to 90°
Resolution	0.1°
Accuracy	±1°

**Lightning Strike**

Range	0–65,535 strikes
Resolution	1 strike
Accuracy	Variable with distance, >25% detection at <10 km typical

**Lightning Average Distance**

Range	0–40 km
Resolution	3 km
Accuracy	Variable

## COMMUNICATION SPECIFICATIONS

### Output

SDI-12 communication

### Data Logger Compatibility

METER ZL6 and EM60 data loggers or any data acquisition systems capable of switched 3.6- to 15.0-VDC excitation and SDI-12 communication

## PHYSICAL CHARACTERISTICS

### Dimensions

Diameter 10 cm (3.94 in)

Height 34 cm (13.39 in), includes rain gauge filter

### Operating Temperature Range

Minimum -50 °C

Typical NA

Maximum 60 °C

**NOTE:** Barometric pressure and relative humidity sensors operate accurately at a minimum of -40 °C.

### Cable Length

5 m (standard)

75 m (maximum custom cable length for additional cost)

**NOTE:** Contact [Customer Support](#) if a nonstandard cable length is needed.

### Connector Types

3.5-mm stereo plug connector or stripped and tinned wires

## ELECTRICAL AND TIMING CHARACTERISTICS

### Supply Voltage (VCC to GND)

Minimum 3.6 VDC continuous

Typical NA

Maximum 15.0 VDC continuous

**NOTE:** The ATMOS 41 must be continuously powered to work properly.

**NOTE:** For the ATMOS 41 to meet digital logic levels specified by SDI-12, it must be excited at 3.9 VDC or greater.

**Digital Input Voltage (logic high)**

Minimum	2.8 V
Typical	3.0 V
Maximum	5.5 V

**Digital Input Voltage (logic low)**

Minimum	-0.3 V
Typical	0.0 V
Maximum	0.8 V

**Digital Output Voltage (logic high)**

Minimum	NA
Typical	3.6 V
Maximum	NA

**NOTE:** For the ATMOS 41 to meet digital logic levels specified by SDI-12, it must be excited at 3.9 VDC or greater.

**Power Line Slew Rate**

Minimum	1.0 V/ms
Typical	NA
Maximum	NA

**Current Drain (during measurement)**

Minimum	0.2 mA
Typical	8.0 mA
Maximum	33.0 mA

**Current Drain (while asleep)**

Minimum	0.2 mA
Typical	0.3 mA
Maximum	0.4 mA

**Power Up Time (SDI ready)—aRx! Commands**

Minimum	NA
Typical	10 s
Maximum	NA

## SYSTEM

### Power Up Time (SDI ready)—Other Commands

Minimum	NA
Typical	800 ms
Maximum	NA

### Measurement Duration

Minimum	NA
Typical	110 ms
Maximum	3,000 ms

## COMPLIANCE

Manufactured under ISO 9001:2015

EM ISO/IEC 17050:2010 (CE Mark)

