B.O.T.E.V. Automatic Weather Station

Technical specification

FEATURES

- WiFi or GSM data transmission
- High-accuracy, industrial grade sensors
- In-house design and manufacturing
- 24/7 access to the measured data
- 32GB SD card local data storage (can hold more than 150M records)
- Configurable intervals: 1 min up to 12h
- Duplicated sensors further improve the reliability of the measurements
- Fully autonomous
- 108Wh battery ensuring more than a month of continuous work without sun
- Power-save mode when battery is low
- 20W solar panel charge the battery even in the shortest days
- Straightforward installation
- 4m rigid stand, made of galvanized steel
- Stainless steel ropes and fasteners

We are proud to present our fully autonomous, automatic weather station B.O.T.E.V.! The abbreviation stands for Bulgarian Observational Tool for Environmental Values. The weather station is powered by a solar panel, and is able to transmit data using long-range GPRS communication, making it ideal for installing on remote and hard-to-reach locations. All sensors are duplicated, and in case of a sensor failure, meteorological data is still recorded and sent. All the data is available 24/7 online on our website, https://meteo.rocks/, as well as historical data and analysis. The stand is produced from high-quality, cadmium-coated stainless steel, providing supreme performance and durability in harsh environments, such as sea-coasts and high mountains.

Contents

General specification and data logger

Parameter	Condition	Value	Unit
Stand dimensions	Height, Max.	380	cm
	Width, Max.	120	cm
Stand material	-	Cadmium plated steel	-
Stand weight	Typ.	18	kg
Data logger dimensions	Height, Typ.	250	mm
	Width, Typ.	350	mm
	Depth, Typ.	150	mm
Data logger weight	Typ.	2.4	kg
Operating temperature	Min.	-40	℃
	Max.	80	℃
Solar panel	Typ.	20	W
Lead-acid battery	Typ.	108	Wh
Battery-only mode (no solar panel)	Max.	42	days
Reporting interval	Min.	1	min
	Typ.	10	min
	Max.	12	h
SD card capacity	Typ.	32	GB
SD card records capacity	Max.	150M	records
Internal clock accuracy	Typ.	±0.432	sec/day
WiFi Antenna gain	Typ.	5	dBm
WiFi range	Typ.	50	m
	Max.	500	m
GSM Antenna gain	Typ.	5	dBm
GSM range	Typ.	>2	km

Table 1. General specifications and data logger

Temperature and humidity sensor

Parameter	Condition	Value	Unit
Resolution	Typ.	0.01	℃
Accuracy tolerance	Typ.	±0.1	℃
	Max.	**Figure 1.**	-
Long term drift	Typ.	<0.03	℃/yr
Specified range	Min.	-40	℃
	Max.	125	℃
Repeatability	Typ.	0.04	℃

Table 2. Temperature sensor specification

Parameter	Condition	Value	Unit
Resolution	Typ.	0.01	%RH
Accuracy tolerance	Typ.	±1.5	%RH
	Max.	**Figure 1.**	-
Long term drift	Typ.	<0.25	%RH/yr
Specified range	Min.	0	%RH
	Max.	100	%RH
Repeatability	Typ.	0.08	%RH

Table 3. Humidity sensor specification

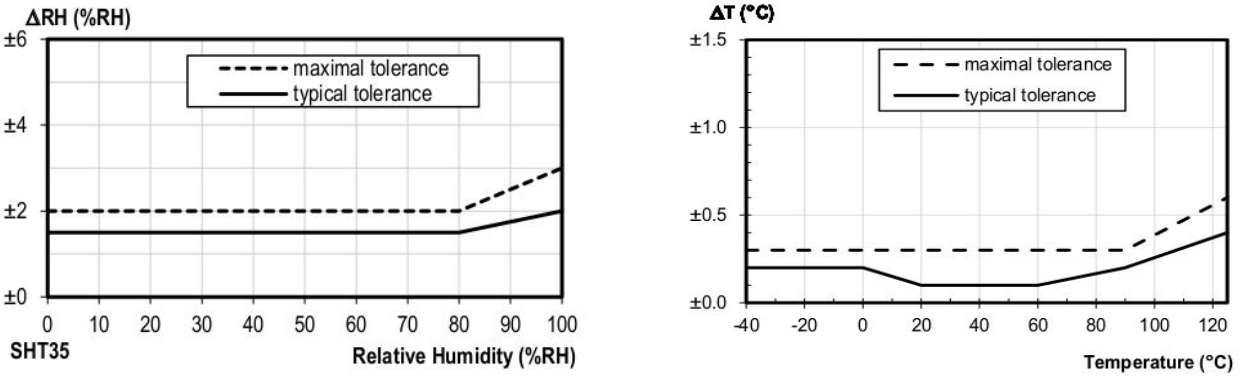


Figure 1. Temperature and humidity sensor accuracy

Atmospheric pressure sensor

Parameter	Condition	Value	Unit
Resolution	Typ.	0.016	mbar
Accuracy tolerance	Typ.	±0.5	mbar
	Max.	**Figure 2.**	-
Long term drift	Typ.	±2	mbar/yr
Specified range	Min.	300	mbar
	Max.	1200	mbar

Table 4. Atmospheric pressure sensor specification

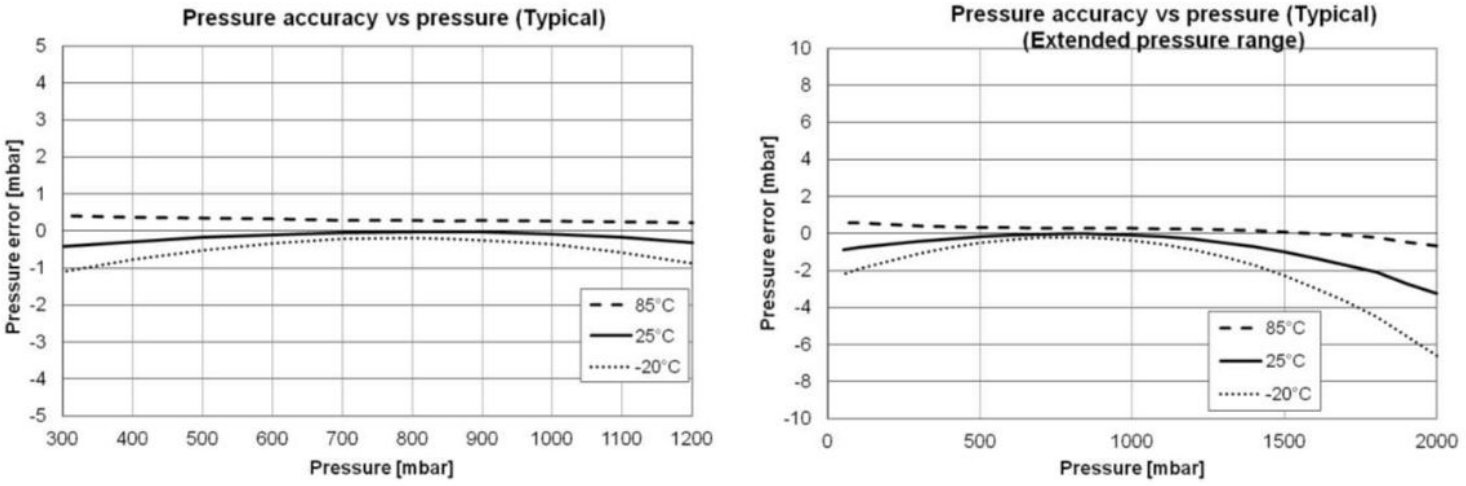


Figure 2. Pressure sensor accuracy

Wind speed and direction sensor

Parameter	Condition	Value	Unit
Resolution	Typ.	0.1	m/s
Accuracy tolerance	Typ.	±0.75	m/s
	Max.	±1.5	m/s
Long term drift	Typ.	<0.01	m/s/yr
Specified range	Min.	0.5	m/s
	Max.	60	m/s

Table 5. Wind speed sensor specification

Parameter	Condition	Value	Unit
Resolution	Typ.	0.1	°
Accuracy tolerance (Figure 3.)	Typ.	±2.5	°
	Max.	±5	°
Long term drift	Typ.	<0.03	°/yr
Specified range	Min.	0	°
	Max.	360.0	°

Table 6. Wind direction sensor specification

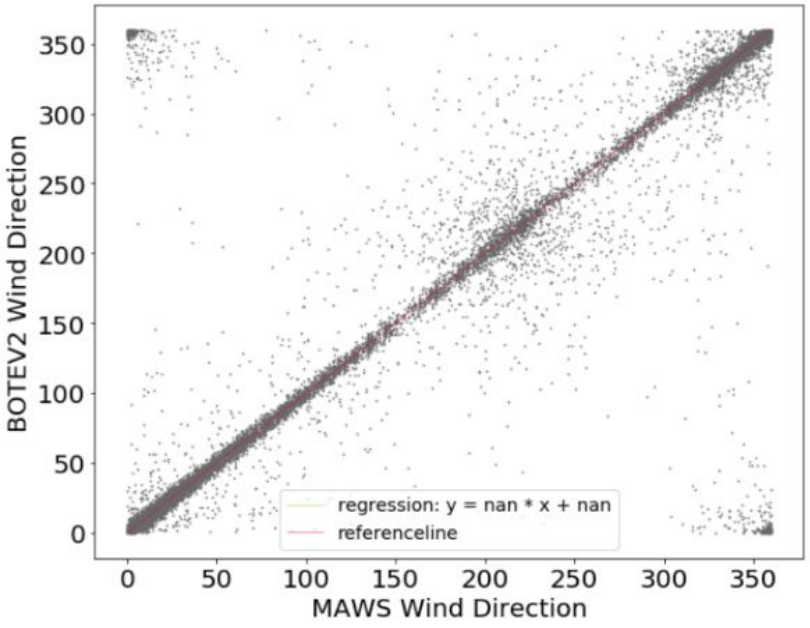
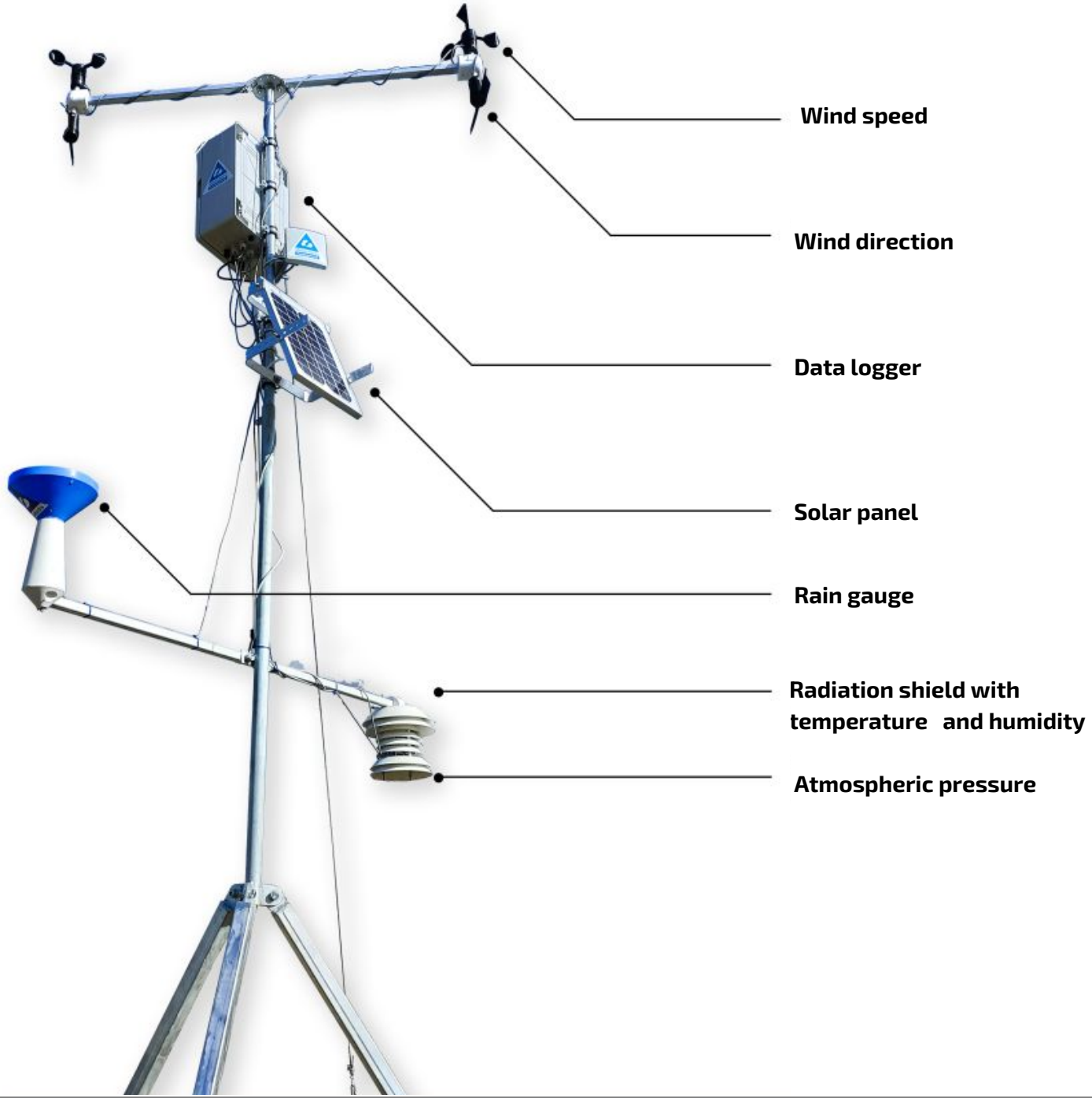


Figure 3. BOTEV vs Vaisala wind direction sensor

Rain gauge

Parameter	Condition	Value	Unit
Resolution	Typ.	0.1	mm
Accuracy tolerance	Typ.	±0.02	mm
	Max.	±0.1	mm
Long term drift	Typ.	<0.02	mm/yr
Specified range	Min.	0.2	mm/h
	Max.	>750	mm/h

Table 7. Rain gauge specification


Wind speed
Wind direction
Data logger
Solar panel
Rain gauge
Radiation shield with temperature and humidity
Atmospheric pressure