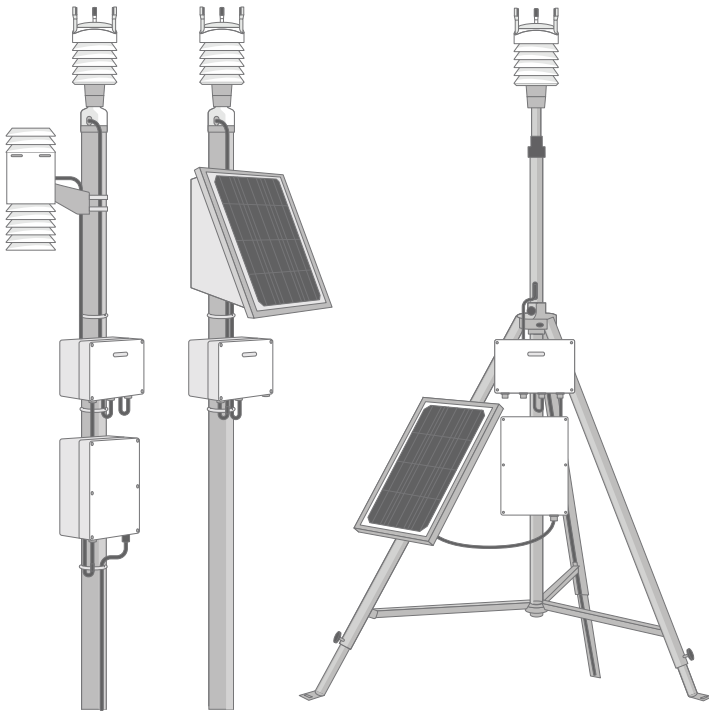


Technical Specification

Vaisala Beacon Station
BWS500



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1. About this document

1.1 Version information

This document provides the technical specifications and regulatory information of Vaisala Beacon Station BWS500.

Table 1 Document versions (English)

Document code	Date	Description
M212450EN-E	December 2021	PSU501 powering specifications have been updated.
M212450EN-D	August 2021	Pin numbering has been updated for DC out connector of PSU501/502.
M212450EN-C	June 2021	Operating environment specifications updated for BWS500, EGW501, SOL501/SOL502, PSU501 and PSU502. Powering specifications updated for PSU501/PSU502. AQT530 specifications added. Appendix A: Simplified EU DoC added.

1.2 Related manuals

Table 2 BWS500 manuals

Document code	Name
M212451EN	<i>Vaisala Beacon Station BWS500 Setup Guide for Mast Installation</i>
M212533EN	<i>Vaisala Beacon Station BWS500 Setup Guide for Tripod Installation</i>
M212525EN	<i>Vaisala Beacon Station BWS500 Spare Part List</i>
M212450EN	<i>Vaisala Beacon Station BWS500 Technical Specification</i>

Table 3 Other manuals

Document	Name
M212639EN	<i>Vaisala Wx Beacon XML API Reference</i>
M212555EN	<i>EGW501 Device Activation Code</i>
M212534EN	<i>EGW501 and PSU501/502 Setup Guide for Wall Installation</i>
M211840EN	<i>Vaisala Weather Transmitter WXT530 Series User Guide</i>

Document	Name
M212573EN	<i>Vaisala Air Quality Transmitter AQT530 Setup Guide</i>
M212572EN	<i>Vaisala Air Quality Transmitter AQT530 Configuration Guide</i>
M212580EN	<i>Vaisala Air Quality Transmitter AQT530 Maintenance Guide</i>

For BWS500 support information and materials, see www.vaisala.com/en/bws500-support.

2. Technical data

2.1 BWS500 specifications

Table 4 BWS500 operating environment

Property	Description/Value
Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	-40 ... +55 °C (-40 ... +131 °F) ¹⁾
Storage temperature	-40 ... +70 °C (-40 ... +158 °F) ¹⁾
Operating humidity	0 ... 100 %RH
Pollution degree	2
Maximum operating altitude	2000 m (approx. 6500 ft)

1) Excluding AQT530. See AQT530 specifications.

Table 5 BWS500 powering

Property	Description/Value
Powering options	<ul style="list-style-type: none"> Power supply unit for AC (mains) power and solar panel use (PSU501) or solar panel use (PSU502) DC input without power supply unit
AC (mains) power	100 ... 240 V AC, ±10 % 50 ... 60 Hz 800 mA
AC (mains) fuse, internal (non-replaceable)	Type 3, 1.5 kV / 3kA
AC (mains) cable connection	<ul style="list-style-type: none"> Conductor cross section (flexible): 0.75 ... 2.5 mm² (20 ... 14 AWG) Cable lead-through: for 6 ... 12.5 mm (0.24 ... 0.49 in) cable
External DC	15 ... 32 V DC Max. 2 A
Solar panel ¹⁾	20 W for Vaisala-provided solar panel
Solar panel input	<ul style="list-style-type: none"> Absolute maximum: 0 ... 32 V DC Operating: 15 ... 32 V DC Maximum 6 A

Property	Description/Value
Battery	Lead-acid battery
Battery capacity	12 V DC, 7 Ah
Overvoltage category	II
Power consumption ²⁾	
EGW501	< 1.5 W, typical
Power output (power supply units)	
PSU501	30 W
PSU502	20 W

- 1) *Solar panel feasibility and operation depends on the installation location and the amount of sunshine.*
- 2) *For power consumption of sensors, see the relevant sensor documentation.*

Table 6 BWS500 communication options

Property	Description/Value
Wireless communication	4G LTE / 3G / 2G
Maintenance communication	USB 3.0 Web UI (locally)
Data collection and visualization	Vaisala Wx Beacon
Data interfaces	<ul style="list-style-type: none"> • Vaisala Wx Beacon open API • Lightweight machine-to-machine (LwM2M) interface
Sensor interfaces	RS-485 Modbus

Table 7 BWS500 compliance

Property	Description/Value
EU directives and regulations	EMC Directive (2014/30/EU) Low Voltage Directive (2014/35/EU) Radio Equipment Directive, RED (2014/53/EU) RoHS Directive (2011/65/EU) amended by 2015/863

Property	Description/Value
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B EN 301489-1 FCC part 15, class B ICES-3 (B)
Electrical safety	EN 61010-1
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Vibration	IEC 60068-2-6 IEC 60068-2-64
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Rough handling	IEC 60068-2-31
Damp heat	IEC 60068-2-78
Compliance marks	CE, EAC/CE, FCC, IC, RCM, UKCA

2.2 EGW501 specifications

Table 8 EGW501 operating environment

Property	Description/Value
Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	-40 ... +55 °C (-40 ... +131 °F)
Storage temperature	-40 ... +70 °C (-40 ... +158 °F)
Operating humidity	0 ... 100 %RH
Pollution degree	2
Maximum operating altitude	2000 m (approx. 6500 ft)
IP rating	IP67: Dust-tight. Protected from the effects of temporary immersion in water under standardized conditions of pressure and time.

Table 9 EGW501 powering

Property	Description/Value
Operating voltage	9 ... 32 V DC
Current consumption, maximum	2 A
Mating connector (power input)	M12 A-coded 4-pin female

Table 10 EGW501 Processing system

Property	Description/Value
Processor	ARM Cortex A9, 800 MHz
Memory	1 GB DDR3L RAM, 8 GB eMMC Flash
Operating system	Linux
Communications protocol	IPv4

Table 11 EGW501 radio module

Property	Value/Description
Acceptance	CE (Europe), EAC/CE (Ukraine), FCC (USA), IC (Canada), RCM (Australia and New Zealand)
SIM card type	Mini-SIM
Frequency bands	
LTE-FDD	B1/ B2/ B3/ B4/ B5/ B7/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B26/ B28
LTE-TDD	B38/ B39/ B40/ B41
WCDMA	B1/ B2/ B4/ B5/ B6/ B8/ B19
GSM	B2/ B3/ B5/ B8

Table 12 EGW501 mechanical specifications

Property	Description/Value
Weight	1 kg (2.2 lb)
Package dimensions (L × W × H)	306 × 184 × 156 mm (12.05 × 7.24 × 6.14 in)
Mating connectors (sensor input)	<ul style="list-style-type: none"> • 1 × M12 8-pin male • 2 × M12 5-pin male
Material, enclosure	Polycarbonate (PC)
Material, connectors	Nickel-plated brass

Table 13 EGW501 compliance

Test	Standard
EU directives and regulations	EMC Directive (2014/30/EU) Low Voltage Directive (2014/35/EU) Radio Equipment Directive, RED (2014/53/EU) RoHS Directive (2011/65/EU) amended by 2015/863
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B EN 301489-1 FCC part 15, class B ICES-3 (B)
Radio compatibility	EN 301 908-1 EN 301 511 FCC part 22, 24, 27, 90
Electrical safety	EN 61010-1
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Vibration	IEC 60068-2-6 IEC 60068-2-64
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Rough handling	IEC 60068-2-31
Damp heat	IEC 60068-2-78
Compliance marks	CE, EAC/CE, FCC, IC, RCM, UKCA

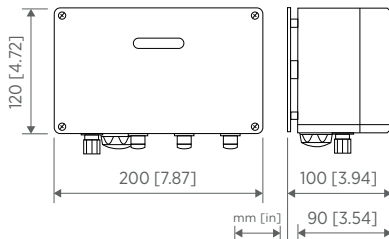


Figure 1 EGW501 dimensions

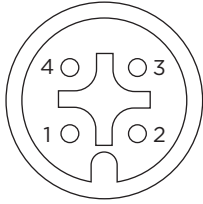


Figure 2 EGW501 power connector pins

- 1 Power+
- 2 RS-485-
- 3 GND
- 4 RS-485+

2.3 Sensors



Some of the sensor specifications may not apply to the sensors in BWS500 as such or may be supported only in the future BWS500 releases.

For up-to-date and a full set of specifications, see the relevant sensor documentation.

2.3.1 WXT536 specifications

Table 14 WXT530 barometric pressure measurement performance

Property	Description/Value
Observation range	500 ... 1100 hPa
Accuracy (for sensor element) at 600 ... 1100 hPa	±0.5 hPa at 0 ... +30 °C (+32 ... +86 °F) ±1 hPa at -52 ... +60 °C (-60 ... +140 °F)
Output resolution	0.1 hPa / 10 Pa / 0.001 bar / 0.1 mmHg / 0.01 inHg
Units available	hPa, Pa, bar, mmHg, inHg

Table 15 WXT530 air temperature measurement performance

Property	Description/Value
Observation range	-52 ... +60 °C (-60 ... +140 °F)
Accuracy (for sensor element) at +20 °C (+68 °F) ¹⁾	±0.3 °C (±0.54 °F)
Output resolution	0.1 °C (0.1 °F)
Units available	°C, °F

1) A naturally aspirated radiation shield is applied which can affect readings in calm wind.

Table 16 WXT530 relative humidity measurement performance

Property	Description/Value
Observation range	0 ... 100 %RH
Accuracy (for sensor element) ¹⁾	±3 %RH at 0 ... 90 %RH ±5 %RH at 90 ... 100 %RH
Output resolution	0.1 %RH
PTU measuring interval	1 ... 3600 s (= 60 min), at 1 s steps

1) A naturally aspirated radiation shield is applied which can affect readings in calm wind.

Table 17 WXT530 precipitation measurement performance

Property ¹⁾	Description/Value
Collecting area	60 cm ² (9.3 in ²)
Rainfall ²⁾	
Output resolution	0.01 mm (0.001 in)
Field accuracy for daily accumulation ³⁾	Better than 5 %, weather-dependent
Units available	mm, in
Duration	Counting each 10-second increment whenever droplet detected
Duration output resolution	10 s
Intensity	Running 1-minute average, 10 s steps
Intensity observation range	0 ... 200 mm/h (0 ... 7.87 in/h) (broader with reduced accuracy)
Intensity output resolution	0.1 mm/h (0.01 in/h)
Units available	mm/h, in/h
Hail ⁴⁾	
Output resolution	0.1 hits/cm ² (1 hits/in ²), 1 hit
Units available	hits/cm ² , hits/in ² , hits
Intensity output resolution	0.1 hits/cm ² h (1 hits/in ² h), 1 hit/h

Property ¹⁾	Description/Value
Units available	hits/cm ² h, hits/in ² h, hits/h

- 1) *Precipitation measurement is performed for liquid precipitation.*
- 2) *Cumulative accumulation after the latest automatic or manual reset.*
- 3) *Due to the nature of the phenomenon, deviations caused by spatial variations may exist in precipitation readings, especially in short time scale. The accuracy specification does not include possible wind-induced error.*
- 4) *Cumulative number of hits against collecting surface.*

Table 18 WXT530 wind measurement performance

Property	Description/Value
Wind speed ¹⁾	
Observation range	0 ... 60 m/s (134 mph)
Reporting range	0 ... 75 m/s (168 mph)
Response time	0.25 s
Available variables	Average, maximum, and minimum
Accuracy	±3 % at 10 m/s (22 mph)
Output resolution	0.1 m/s (km/h, mph, knots)
Units available	m/s, km/h, mph, knots
Wind direction ¹⁾	
Azimuth	0 ... 360°
Response time	0.25 s
Available variables	Average, maximum, and minimum
Accuracy	±3.0° at 10 m/s (22 mph)
Output resolution	1°
Averaging time	1 ... 3600 s, sample rate 1, 2, or 4 Hz (configurable)

- 1) *NTP (normal temperature and pressure) condition applied for wind tunnel testing.*

Table 19 WXT530 inputs and outputs

Property	Description/Value
Operating voltage	6 ... 24 V DC (-10 ... +30 %)

Property	Description/Value
Average power consumption	Minimum: 0.1 mA at 12 V DC (SDI-12 standby) Typical: 3.5 mA at 12 V DC (typical measuring intervals) ¹⁾ Maximum: 15 mA at 6 V DC (constant measurement of all parameters)
Heating voltage	DC, AC, or full-wave rectified AC 12 ... 24 V DC (-10 ... +30 %) 12 ... 17 V AC _{rms} (-10 ... +30 %)
Typical heating current	12 V DC: 800 mA, 24 V DC: 400 mA 12 V AC _{rms} : 1.1 A 17 V AC _{rms} : 800 mA
Digital outputs	SDI-12, RS-232, RS-485, RS-422
Communication protocols	SDI-12 v1.3, Modbus RTU, ASCII automatic and polled, NMEA 0183 v3.0 with query option
Self-diagnostic	Separate supervisor message, unit/status fields to validate measurement stability
Startup	Automatic, < 5 seconds from power on to the first valid output

1) *Wind 10-second average with 2-minute interval at 4 Hz sampling rate, RS-232 19200 bps with jumper wires, PTU 10-second interval, Pt1000, level, tipping bucket, and solar radiation 5-second interval.*

Table 20 WXT530 operating environment

Property	Description/Value
Operating environment	Outdoor use
Operating temperature	-52 ... +60 °C (-60 ... +140 °F)
Storage temperature	-60 ... +70 °C (-76 ... +158 °F)
Operating humidity	0 ... 100 %RH
Operating pressure	500 ... 1100 hPa
Wind ¹⁾	0 ... 60 m/s (0 ... 134 mph)

Property	Description/Value
IP rating	Without mounting kit: IP65: Dust-tight. Protected from water jets from any direction. With mounting kit: IP66: Dust-tight. Protected from powerful water jets from any direction.

- 1) *Due to the measurement frequency used in the sonic transducers, RF interference in the 200 ... 400 kHz range can disturb wind measurement.*

Table 21 WXT530 compliance

Property	Description/Value
EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) amended by 2015/863
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B
Environmental	IEC 60068-2-1, 2, 6, 14, 30, 31, 52, 78 IEC 60529, VDA 621-415
Maritime	IEC 60945 (Exposed) DNV GL Type Examination Certificate No. TAA00000VF
Compliance marks	CE, RCM, RoHS, China RoHS, UKCA

Table 22 WXT530 mechanical specifications

Property	Description/Value
Weight	
	0.7 kg (1.54 lb)
Materials	
Radiation shield, top, and bottom parts	Polycarbonate +20 % fiberglass
Precipitation sensor plate	Stainless steel (AISI 316)

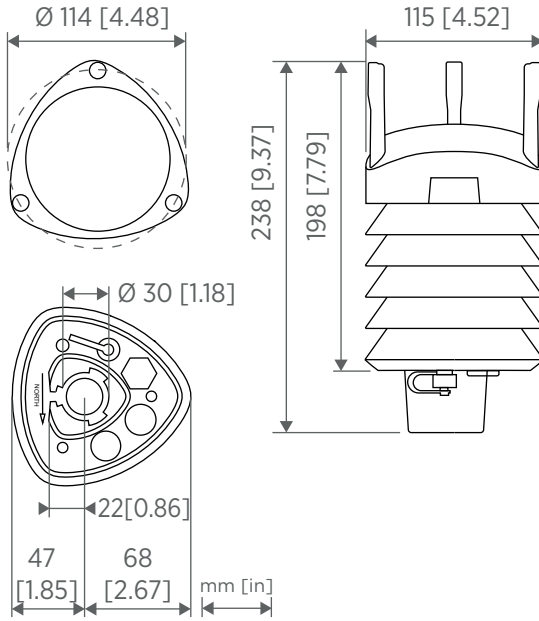


Figure 3 WXT536 dimensions

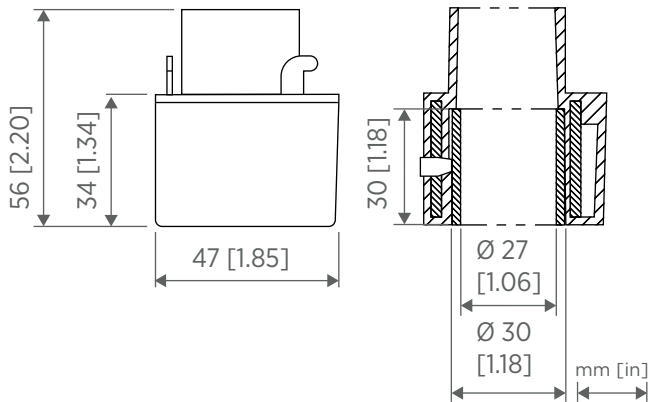


Figure 4 WXT530 mounting kit (212792) dimensions

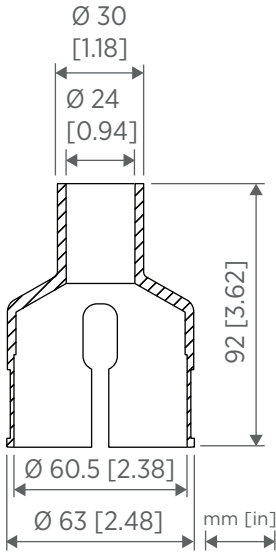


Figure 5 Mounting accessory (WMSFIX60) for connecting mounting kit (212792) and 60-mm tube

2.3.2 AQT530 specifications

Table 23 AQT530 measurement performance – gases

Property	NO ₂	NO	O ₃	CO
Concentration range	2000 ppb	2000 ppb	2000 ppb	10 000 ppb
Detection limit	5 ppb	5 ppb	5 ppb	10 ppb

Table 24 AQT530 field performance – gases

Property ¹⁾	NO ₂ ²⁾	NO	O ₃ ²⁾	CO
Correlation with reference ³⁾	R ² : 0.70	R ² : 0.75	R ² : 0.50	R ² : 0.85
Accuracy ⁴⁾	7 ppb	15 ppb	11 ppb	183 ppb
Unit-to-unit correlation ⁵⁾	R ² : 0.93	R ² : 0.96	R ² : 0.84	R ² : 0.97

Property ¹⁾	NO ₂ ²⁾	NO	O ₃ ²⁾	CO
Precision ⁵⁾	3 ppb	3 ppb	4 ppb	25 ppb

- 1) All values are based on 1-hour averages with factory calibration, no linear correction applied. Values are obtained from global field testing in major climate zones against reference instruments. The values represent typical values and may be different based on the location.
- 2) At 10 V/m RF field test, the presence of electromagnetic interference in the range of 800 ... 900 MHz may cause additional deviation for NO₂ and O₃.
- 3) Typical R² against a reference grade instrument derived from field tests globally.
- 4) Mean absolute error against reference.
- 5) Mean absolute difference of AQT530 reading from average reading of AQT530s.

Table 25 AQT530 measurement performance – particles

Property	PM _{2.5}	PM ₁₀
Size range ¹⁾	0.6 ... 2.5 µm	0.6 ... 10 µm
Concentration range ²⁾	0 ... 1000 µg/m ³	0 ... 2500 µg/m ³
Detection limit	0.1 µg/m ³	0.1 µg/m ³
Accuracy ³⁾	5 %	6 %
Precision ^{3) 4)}	2 %	2 %

- 1) Spherical equivalent size of DEHS particles. Lower detection limit of 0.6 µm defined as 50 % detection efficiency for DEHS particles.
- 2) Specified with ISO12103-1, A1 ultrafine test dust.
- 3) Measured against a certified reference grade instrument at room temperature using Arizona dust equivalent (ISO12103-1, A1 Ultrafine test dust). PM_{2.5} measured at 150 µg/m³ and PM₁₀ at 1300 µg/m³. Accuracy and precision are defined with 2 standard deviations.
- 4) Unit-to-unit variation. Defined as difference of AQT530 reading from average reading of AQT530s.

Table 26 AQT530 field performance – particles

Property ¹⁾	PM _{2.5}	PM ₁₀
Correlation with reference ²⁾	R ² : 0.65	R ² : 0.75
Accuracy ³⁾	9 µg/m ³	13 µg/m ³
Unit-to-unit correlation ⁴⁾	R ² : 0.97	R ² : 0.97

Property ¹⁾	PM _{2.5}	PM ₁₀
Precision ⁴⁾	2 µg/m ³	3 µg/m ³

- 1) *All values are based on 1-hour averages with factory calibration, no linear correction applied. Values are obtained from global field testing in major climate zones against different reference equivalent methods. The values represent typical values and may be different based on the location and reference instrument. Majority of particle mass within size range.*
- 2) *Typical R² against a reference grade instrument derived from field tests globally.*
- 3) *Mean absolute error against reference.*
- 4) *Mean absolute difference of AQT530 reading from average reading of AQT530s.*

Table 27 AQT530 operating environment

Property	Description/Value
Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	-30 ... +40 °C (-22 ... +104 °F) ¹⁾
Storage temperature	+20 ... +25 °C (+68 ... +77 °F)
Operating humidity	15 ... 100 %RH, non-condensing ^{2) 3)}
Storage humidity	20 ... 75 %RH
Operating pressure	800 ... 1150 hPa
IP rating	IP65: Dust-tight. Protected from water jets from any direction. ⁴⁾

- 1) *Optimal performance at -10 ... +30 °C (-14 ... +86 °F).*
- 2) *Optimal performance at 15 ... 90 %RH. Operation in low-humidity environments may weaken the gas measurement performance. Operation in high-humidity environments may weaken the particle measurement performance.*
- 3) *Water uptake of particles may result in PM overestimation. In most cases this is indicated by the sensor.*
- 4) *Specified for gas measurement device only.*

Table 28 AQT530 powering

Property	Description/Value
Operating voltage	10 - 25 V DC Max. 1 A at 10 V DC ¹⁾
Power consumption, max. peak ¹⁾	10 W
Power consumption (average with default settings)	
Gas and particle measurement	1.8 ... 4.4 W ²⁾

Property	Description/Value
Gas measurement	1.4 ... 3.8 W ³⁾
Particle measurement	1.7 ... 2.0 W ⁴⁾

- 1) Humidity management active, particle measurement active, temperature < 0 °C (32 °F).
- 2) Maximum consumption when humidity > 85 %RH, temperature < 0 °C (32 °F), default particle measurement cycle.
- 3) Maximum consumption when humidity > 85 %RH.
- 4) Maximum consumption when temperature < 0 °C (32 °F), default particle measurement cycle.

Table 29 AQT530 data connection specifications

Property	Description/Value
Data output	Modbus® ASCII, Modbus® RTU, ASCII CSV
Serial data interface	RS-485
Maintenance interface ¹⁾	RS-232

- 1) Recommended Vaisala USB maintenance cable kit (253163SET).

Table 30 AQT530 mechanical specifications

Property	Description/Value
Dimensions (H × Ø)	335 × 133 mm (13.19 × 5.24 in)
Weight, with mounting kit	2.4 kg (5.29 lb)
Color, radiation shield	White (RAL9003)
Material, base module	Anodized aluminum
Material, radiation shield	Polycarbonate (PC)
Power and data connector	Standard 8-pin M12 male

Table 31 AQT530 compliance

Property	Description/Value
EU directives and regulations	EMC Directive (2014/30/EU) REACH Regulation (EC 1907/2006) RoHS Directive (2011/65/EU) amended by 2015/863
EMC immunity ¹⁾	EN 61326-1, industrial environment
EMC emissions	CISPR 32 / EN 55032, Class B

Property	Description/Value
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Damp heat	IEC 60068-2-78
Eye safety	IEC 60825-1:2014 Class 1 laser product
Compliance marks	CE, China RoHS, FCC, RCM, UKCA

1) At 10 V/m RF field test, the presence of electromagnetic interference in the range of 800 ... 900 MHz may cause additional deviation for NO₂ and O₃.

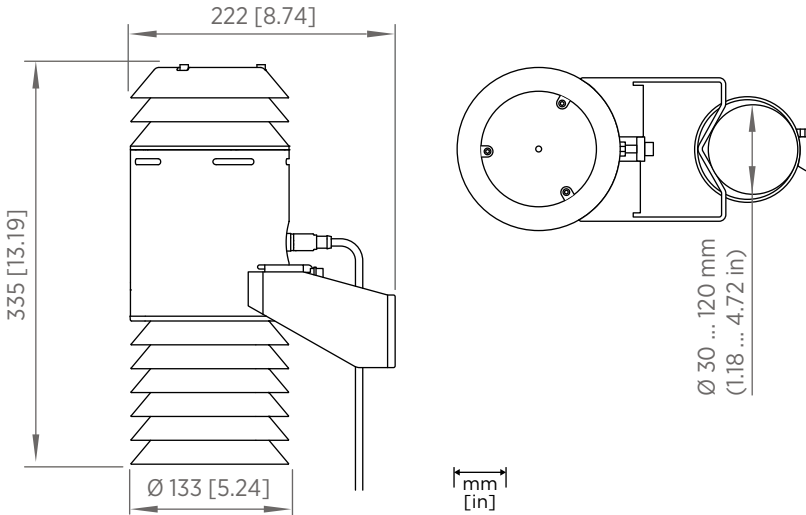


Figure 6 AQT530 dimensions

2.4 Powering

2.4.1 SOL501/SOL502 specifications

Table 32 SOL501/SOL502 specifications

Property	Description/Value
Operating environment	Outdoor use

Property	Description/Value
Use in wet location	Yes
Nominal voltage	12 V DC
Maximum power	20 W
Voltage at maximum power (V_{mpp}), typical	18.5 V
Current at maximum power (I_{mpp}), typical	1.09 A
Open-circuit voltage	22.6 V
Short-circuit current (I_{sc}), typical	1.19 A
Dimensions (H × W × D), without mounting frame	440 × 350 × 49.6 mm (17.32 × 13.78 × 1.95 in)
Dimensions (H × W × D), including mounting frame	377.5 × 350 × 319.7 mm (14.86 × 13.78 × 12.59 in)
Weight, including mounting frame	4.3 kg (9.5 lb)
Weight, including mounting frame and power supply unit PSU502	7.8 kg (17.2 lb)

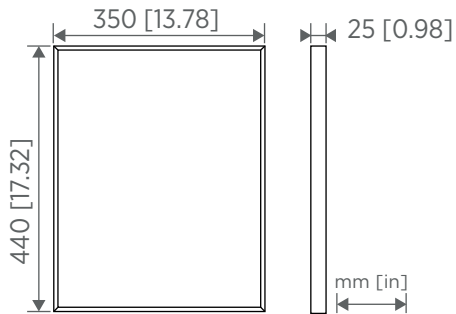


Figure 7 SOL501 dimensions

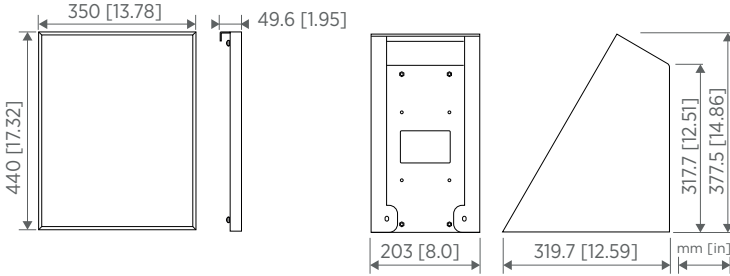


Figure 8 SOL502 dimensions

2.4.2 PSU501 specifications

Table 33 PSU501 specifications

Property	Description/Value
Operating environment	
Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	-40 ... +55 °C (-40 ...+131 °F) ¹⁾
Operating humidity	0 ... 100 %RH
Pollution degree	2
Maximum operating altitude	2000 m (approx. 6500 ft)
IP rating	IP65: Dust-tight. Protected from water jets from any direction.
Powering ²⁾	
Input power (AC)	100 ... 240 V AC, ±10 % 50 ... 60 Hz 800 mA
Input power (DC) ³⁾	15 ... 32 V DC Max. 2 A
Nominal output voltage, AC input connected	24 V In backup (battery) mode: 12 V
Nominal output voltage, AC input not connected	12 V ⁴⁾
DC output current	Max. 1.2 A
AC (mains) fuse, internal (nonreplaceable)	Type 3, 1.5 kV / 3kA

Property	Description/Value
AC (mains) cable connection	<ul style="list-style-type: none"> Conductor cross section (flexible): 0.75 ... 2.5 mm² (20 ... 14 AWG) Cable lead-through: for 6 ... 12.5 mm (0.24 ... 0.49 in) cable
Overvoltage category	II
Battery type ⁵⁾	Valve-regulated lead-acid (VRLA) battery
Nominal battery capacity	12 V DC, 7 Ah
Expected battery lifetime	3 ... 5 years
Battery dimensions (H × W × L)	Approx. 97.5 × 65 × 151 mm (3.84 × 2.56 × 5.94 in)
Mechanical specifications	
Dimensions (H × W × L)	244.5 × 164.2 × 101.0 mm (9.63 × 6.46 × 3.98 in)
Weight	4 kg (8.8 lb)
Material, enclosure	Polycarbonate
Mating connectors	<ul style="list-style-type: none"> DC in: M12 A-coded 4-pin female DC out: M12 A-coded 4-pin male AC in: 4-pin female circular connector

- 1) *The capacity of the backup battery degrades in cold temperatures.*
- 2) *In PSU501, solar panel or other external DC power supply is connected to **DC in**. EGW501 of Beacon Station is connected to **DC out**.*
- 3) *DC power supply must have reinforced insulation between AC (mains) and output.*
- 4) *The actual output voltage equals the DC input voltage (max. 32 V).*
- 5) *Vaisala recommends, for example, YUASA NP7-12.*

Table 34 PSU501 and PSU502 compliance

Test	Standard
EU directives and regulations	EMC Directive (2014/30/EU) Low Voltage Directive (2014/35/EU) RoHS Directive (2011/65/EU) amended by 2015/863
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B FCC part 15, class B
Electrical safety	EN 61010-1 ¹⁾
Cold	IEC 60068-2-1

Test	Standard
Dry heat	IEC 60068-2-2
Vibration	IEC 60068-2-6 IEC 60068-2-64
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Rough handling	IEC 60068-2-31
Damp heat	IEC 60068-2-78
Compliance marks	CE, FCC, RCM, UKCA

1) Applies only to PSU501.

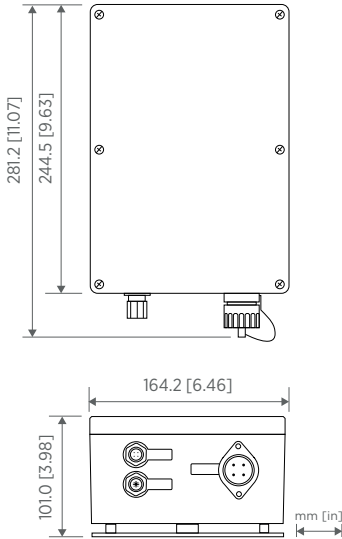


Figure 9 PSU501 dimensions

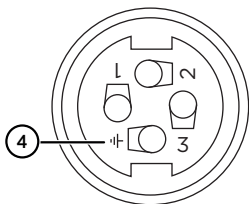


Figure 10 PSU501 AC in connector pins

- 1 Phase L
- 2 Not connected
- 3 Neutral N
- 4 Ground PE

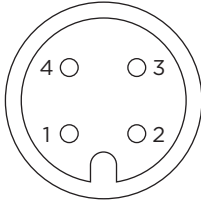


Figure 11 PSU501 DC in connector pins

- 1 Power+
- 2 Not connected
- 3 GND
- 4 Not connected

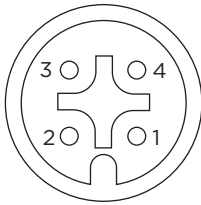


Figure 12 PSU501 DC out connector pins

- 1 Power+
- 2 RS-485-
- 3 GND
- 4 RS-485+

2.4.3 PSU502 specifications

Table 35 PSU502 specifications

Property	Description/Value
Operating environment	
Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	-40 ... +55 °C (-40 ... +131 °F) ¹⁾
Operating humidity	0 ... 100 %RH
Pollution degree	2
Maximum operating altitude	2000 m (approx. 6500 ft)
IP rating	IP65: Dust-tight. Protected from water jets from any direction.
Powering	
Input power	15 ... 32 V DC Max. 2 A
Nominal output voltage	12 V ²⁾
Battery type ³⁾	Valve-regulated lead-acid (VRLA) battery
Nominal battery capacity	12 V DC, 7 Ah
Expected battery lifetime	3 ... 5 years

Property	Description/Value
Battery dimensions (H × W × L)	Approx. 97.5 × 65 × 151 mm (3.84 × 2.56 × 5.94 in)
Mechanical specifications	
Dimensions (H × W × L)	244.5 × 164.2 × 101.0 mm (9.63 × 6.46 × 3.98 in)
Weight	3.9 kg (8.6 lb)
Material, enclosure	Polycarbonate
Mating connectors	<ul style="list-style-type: none"> • DC in: M12 A-coded 4-pin female • DC out: M12 A-coded 4-pin male

- 1) *The capacity of the backup battery degrades in cold temperatures.*
- 2) *The actual output voltage equals the DC input voltage (max. 32 V).*
- 3) *Vaisala recommends, for example, YUASA NP7-12.*

Table 36 PSU501 and PSU502 compliance

Property	Description/Value
EU directives and regulations	EMC Directive (2014/30/EU) Low Voltage Directive (2014/35/EU) RoHS Directive (2011/65/EU) amended by 2015/863
EMC compatibility	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B FCC part 15, class B
Electrical safety	EN 61010-1 ¹⁾
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Vibration	IEC 60068-2-6 IEC 60068-2-64
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Rough handling	IEC 60068-2-31
Damp heat	IEC 60068-2-78
Compliance marks	CE, FCC, RCM, UKCA

- 1) *Applies only to PSU501.*

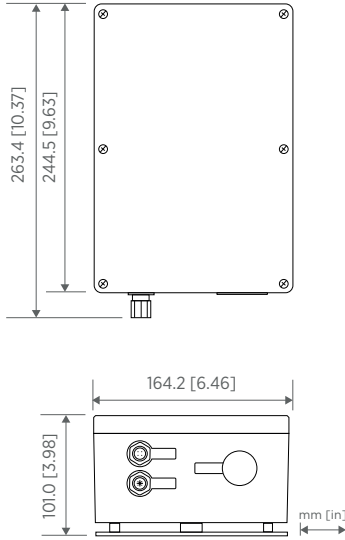


Figure 13 PSU502 dimensions

Figure 14 PSU502 DC in connector pins

- 1 Power+
- 2 Not connected
- 3 GND
- 4 Not connected

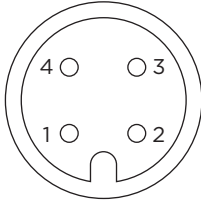
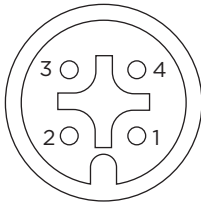


Figure 15 PSU502 DC out connector pins

- 1 Power+
- 2 RS-485-
- 3 GND
- 4 RS-485+



Appendix A. FCC/ISED regulatory notices

Modification statement

Vaisala Oyj has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Vaisala Oyj n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

Interference statement

This device complies with Part 15 of the FCC Rules and Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Wireless notice

This equipment complies with FCC and ISED radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil est conforme aux limites d'exposition aux rayonnements de l'ISDE pour un environnement non contrôlé. L'antenne doit être installée de façon à garder une distance minimale de 20 centimètres entre la source de rayonnements et votre corps. L'émetteur ne doit pas être colocalisé ni fonctionner conjointement avec à autre antenne ou autre émetteur.

FCC Class B digital device notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAN ICES-3 (B) / NMB-3 (B)

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de classe B est conforme à la norme canadienne NMB-003.

Appendix B. EU Declaration of Conformity

BG: С настоящото Vaisala Oyj декларира, че този тип радиосъоръжение BWS500 е в съответствие с Директива 2014/53/ЕС. Цялостният текст на ЕС декларацията за съответствие може да се намери на следния интернет адрес: www.vaisala.com/declarationofconformity

CS: Tímto Vaisala Oyj prohlašuje, že typ rádiového zařízení BWS500 je v souladu se směrnicí 2014/53/EU. Úplné znění EU prohlášení o shodě je k dispozici na této internetové adrese: www.vaisala.com/declarationofconformity

DA: Hermed erklærer Vaisala Oyj, at radioudstyrtypen BWS500 er i overensstemmelse med direktiv 2014/53/EU. EU-overensstemmelseserklæringens fulde tekst kan findes på følgende internetadresse: www.vaisala.com/declarationofconformity

DE: Hiermit erklärt Vaisala Oyj, dass der Funkanlagentyp BWS500 der Richtlinie 2014/53/EU entspricht. Der vollständige Text der EU-Konformitätserklärung ist unter der folgenden Internetadresse verfügbar: www.vaisala.com/declarationofconformity

EL: Με την παρούσα ο/η Vaisala Oyj, δηλώνει ότι ο ραδιοεξοπλισμός BWS500 πληροί την οδηγία 2014/53/ΕΕ. Το πλήρες κείμενο της δήλωσης συμμόρφωσης ΕΕ διατίθεται στην ακόλουθη ιστοσελίδα στο διαδίκτυο: www.vaisala.com/declarationofconformity

EN: Hereby, Vaisala Oyj declares that the radio equipment type BWS500 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: www.vaisala.com/declarationofconformity

ES: Por la presente, Vaisala Oyj declara que el tipo de equipo radioeléctrico BWS500 es conforme con la Directiva 2014/53/UE. El texto completo de la declaración UE de conformidad está disponible en la dirección Internet siguiente: www.vaisala.com/declarationofconformity

ET: Käesolevaga deklareerib Vaisala Oyj, et käesolev raadioseadme tüüp BWS500 vastab direktiivi 2014/53/EL nõuetele. ELi vastavusdeklaratsiooni täielik tekst on kättesaadav järgmisel internetiaadressil: www.vaisala.com/declarationofconformity

FI: Vaisala Oyj vakuuttaa, että radiolaitetyyppi BWS500 on direktiivin 2014/53/EU mukainen. EU-vaatimustenmukaisuusvakuutuksen täysimittainen teksti on saatavilla seuraavassa internetosoitteessa: www.vaisala.com/declarationofconformity

FR: Le soussigné, Vaisala Oyj, déclare que l'équipement radioélectrique du type BWS500 est conforme à la directive 2014/53/UE. Le texte complet de la déclaration UE de conformité est disponible à l'adresse internet suivante: www.vaisala.com/declarationofconformity

HR: Vaisala Oyj ovime izjavljuje da je radijska oprema tipa BWS500 u skladu s Direktivom 2014/53/EU. Cjeloviti tekst EU izjave o sukladnosti dostupan je na sljedećoj internetskoj adresi: www.vaisala.com/declarationofconformity

HU: Vaisala Oyj igazolja, hogy a BWS500 típusú rádióberendezés megfelel a 2014/53/EU irányelvnek. Az EU-megfelelőségi nyilatkozat teljes szövege elérhető a következő internetes címen: www.vaisala.com/declarationofconformity

IT: Il fabbricante, Vaisala Oyj , dichiara che il tipo di apparecchiatura radio BWS500 è conforme alla direttiva 2014/53/UE. Il testo completo della dichiarazione di conformità UE è disponibile al seguente indirizzo Internet: www.vaisala.com/declarationofconformity

LT: Aš, Vaisala Oyj , patvirtinu, kad radijo įrenginių tipas BWS500 atitinka Direktyvą 2014/53/ES. Visas ES atitikties deklaracijos tekstas prieinamas šiuo interneto adresu: www.vaisala.com/declarationofconformity

LV: Ar šo Vaisala Oyj deklarē, ka radioiekārta BWS500 atbilst Direktīvai 2014/53/ES. Pilns ES atbilstības deklarācijas teksts ir pieejams šādā interneta vietnē: www.vaisala.com/declarationofconformity

MT: B'dan, Vaisala Oyj , niddikjara li dan it-tip ta' taghmir tar-radju BWS500 huwa konformi mad-Direttiva 2014/53/UE. It-test kollu tad-dikjarazzjoni ta' konformità tal-UE huwa disponibbli f'dan l-indirizz tal-Internet li ġej: www.vaisala.com/declarationofconformity

NL: Hierbij verklaar ik, Vaisala Oyj , dat het type radioapparatuur BWS500 conform is met Richtlijn 2014/53/EU. De volledige tekst van de EU-conformiteitsverklaring kan worden geraadpleegd op het volgende internetadres: www.vaisala.com/declarationofconformity

PL: Vaisala Oyj niniejszym oświadcza, że typ urządzenia radiowego BWS500 jest zgodny z dyrektywą 2014/53/UE. Pełny tekst deklaracji zgodności UE jest dostępny pod następującym adresem internetowym: www.vaisala.com/declarationofconformity

PT: O(a) abaixo assinado(a) Vaisala Oyj declara que o presente tipo de equipamento de rádio BWS500 está em conformidade com a Diretiva 2014/53/UE. O texto integral da declaração de conformidade está disponível no seguinte endereço de Internet: www.vaisala.com/declarationofconformity

RO: Prin prezenta, Vaisala Oyj declară că tipul de echipamente radio BWS500 este în conformitate cu Directiva 2014/53/UE. Textul integral al declarației UE de conformitate este disponibil la următoarea adresă internet: www.vaisala.com/declarationofconformity

SK: Vaisala Oyj týmto vyhlasuje, že rádiové zariadenie typu BWS500 je v súlade so smernicou 2014/53/EU. Úplné EÚ vyhlásenie o zhode je k dispozícii na tejto internetovej adrese: www.vaisala.com/declarationofconformity

SL: Vaisala Oyj potrjuje, da je tip radijske opreme BWS500 skladen z Direktivo 2014/53/EU. Celotno besedilo izjave EU o skladnosti je na voljo na naslednjem spletnem naslovu: www.vaisala.com/declarationofconformity

SV: Härmed försäkrar Vaisala Oyj att denna typ av radioutrustning BWS500 överensstämmer med direktiv 2014/53/EU. Den fullständiga texten till EU-försäkran om överensstämmelse finns på följande webbadress: www.vaisala.com/declarationofconformity

Warranty

For standard warranty terms and conditions, see www.vaisala.com/warranty.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Technical support



Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information as applicable:

- Product name, model, and serial number
- Software/Firmware version
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see www.vaisala.com/support.

Recycling



Recycle all applicable material.



Follow the statutory regulations for disposing of the product and packaging.

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