VAISALA

Automatic Weather Station AWS430

for Meteorological and Oceanographic Data in Maritime Environments

Features

- Specifically designed for critical maritime weather applications
- High-quality anti-corrosive design
- Complies with Lloyd's Register and IEC 60945 requirements
- High data availability
- Built-in test procedures and data validation
- Accurate true wind calculation even from multiple sensors
- Meets NMEA 0183 and IEC 1162-1 requirements for data communication
- Complies with CAP 437, HCA, NORSOK, and BSL D5-1 requirements for offshore helicopter landing areas

AWS430 is designed for maritime environments such as ports, ships, and offshore platforms.

AWS430 contains either a waterproof outdoor enclosure with various mounting options or a 19-inch equipment rack unit. The outdoor enclosure is designed to withstand the corrosive conditions that prevail aboard ships and platforms as well as the freezing conditions experienced in extreme-weather environments. It is also able to endure vibration and shock.

Wide Range of High Quality Measurements

AWS430 measures the following basic weather parameters: wind speed and direction (relative wind, true wind, upwind), atmospheric pressure, air temperature, and humidity. Additional sensors can be installed for measuring other parameters, including water temperature, duration of rain and sunshine, global and long wave radiation, amount of precipitation, cloud height, visibility, tide, wave height and direction, water level, ocean current speed and direction, and ship motion. AWS430 has built-in calculation for many meteorological and statistical parameters such as dew point temperature.

Flexible Integration

To obtain the most accurate true wind calculation, the ship's own gyrocompass and navigation system can be used to provide the required heading and ship speed, direction, and position information. However, an optional GPS compass can also be integrated into the system.

The system fully supports all the requirements for data communication as specified in NMEA 0183 and IEC 1162-1. When the system is equipped with several wind sensors, the built-in selection algorithm selects the most accurate wind data from these sensors.

AWS430 supports LAN connection with XML and Modbus® TCP/IP protocols and remote maintenace functionality. Satellite communication options are also available.

Self-diagnostics and Constant Data Availability

To ensure data quality, the built-in algorithms continuously monitor the sensor data, providing an immediate alert in case of a fault. For every parameter, the minimum and maximum readings as well as step limits are tested. Various parameters are also cross-checked.

Designed for Demanding Maritime Applications

All the materials of AWS430 have been selected for their ability to withstand the harsh, corrosive conditions experienced in maritime environments. The station has successfully passed a wide variety of environmental, electrical, vibration, and shock tests. All test specifications comply with both the Lloyds' Register approval system and the IEC 60945 international maritime standard.

Technical Data

Outdoor Enclosure Specifications

Operating temperature	−50 ... +60 °C (−58 ... +140 °F)
Storage temperature	−50 ... +70 °C (−58 ... +158 °F)
Operating humidity	0 ... 100 %RH, non-condensing
IP rating	IP66
Dimensions (H × W × D)	600 × 500 × 200 mm (23.62 × 19.69 × 7.87 in)
Material	Stainless steel (AISI316), painted white
Weight	Max. 40 kg (88.18 lb)
Shock	MIL-STD-202G, Method 213B
Vibration	IEC 60945
Backup battery	2.6 Ah / 12 V

19-inch Rack Specifications

Operating temperature	−25 ... +60 °C (−13 ...+140 °F)
Storage temperature	−50 ... +70 °C (−58 ...+158 °F)
Operating humidity	0 ... 100 %RH, non-condensing
IP rating	IP21
Dimensions (H × W × D)	177 × 433 × 555 mm (6.97 × 17.05 × 21.85 in)
Material	Aluminum
Weight	Max. 15 kg (33.07 lbs)
Shock	MIL-STD-202G, Method 213B
Vibration	IEC 60945
Back-up battery	2.6 Ah / 12 V

Mechanical Specifications

Materials	Stainless steel Anodized sea aluminum UV resistant plastic

Powering Specifications

Powering	90 ... 264 VAC, 45 ... 65 Hz 24 ... 28 VDC (max. 30 VDC) [1)]
Internal battery	2.6 Ah / 12 V Battery regulator charge/recharge control Temperature compensation Deep discharge protection

1) DC powering available only with the outdoor enclosure

Data Validation, Calculations, and Reports

Data quality control	Upper/Lower climatological limits Step change validation
Statistical calculations	Averaging over user-set periods True and relative wind, wind selection (upwind)
Message inputs	NMEA 0183 HDT/RMC/VTG/GLL
Message outputs	NMEA 0183 MVW/XDR/MTW Vaisala SMSAWS XML format Modbus® TCP/IP and serial

Communication Options

Satellite communication	Iridium, Inmarsat-C
Wireless communication	UHF, VHF, GSM, GPRS
Landline communication	RS-232, RS-485 bus, LAN, ModBus, TCP/IP, and serial
Data displays	Vaisala PC display software Vaisala Panel Displays

Sensor Options

Basic Options	
Wind speed and direction	WMT700
Atmospheric pressure	BARO-1, PTB330
Air temperature, relative humidity, and dew point	HMP155
Rain/Precipitation	RM Young 50202, RG13(H), DRD11A
Water temperature	DTS12W
GPS satellite compass	Vector G2
Visibility and present weather	PWD series
Ceilometer	CL31
Wave height, direction, period, and tide	Radac WG5 series
Current speed and direction	Aanderaa 4830R, Nortek Aquadopp, Nortek AWAC
Water salinity	Aanderaa 4419R
Water level	Keller PAA 36 X W, VEGAPULS
Ship motion	SMC IMU-108
Solar radiation / Sun duration	Kipp & Zonen solar instruments
Options for Hazardous Areas	
Wind speed and direction	Gill IS WindObserver
Atmospheric pressure	Keller PAA-33 X Ei
Air temperature, relative humidity, and dew point	HMT360
Wave height, direction, period, and tide	Radac WG5 Ex
Additional Options	
RS-485/RS-232 sensors	
SDI-12 sensors	
Ethernet devices	
Analog sensors, with differential measurement up to 10 sensors	
Digital sensors, 2 counter/frequency inputs	
Software-controlled power outputs	

Compliance

In compliance with the following:

- Lloyd's Register (LR) Type Approval System, Test Specification Number 1: 2002, Performance and Environmental Test Specification for the Environmentally Tested Products used in Marine and Offshore Applications
- IEC 60945 International Standard, 4th edition, 2002-08, Maritime Navigation and Radio communication Equipment and Systems - General Requirements Methods of Testing and Required Test Results

Vibration	IEC 60068-2-6/IEC 60945
Shock	MIL-STD-202G, Method 213B, cond. J
Dry heat	IEC 60068-2-2/IEC 60068-2-48
Damp heat	Cyclic IEC 60068-2-30
Extreme conditions	IEC 60068-2-3, Test Ca [1)]
Low temperature	IEC 60068-2-1 Test Ab/Ad [1)]
Rain and spray	IEC 60529/IEC 60945 [1)]
Corrosion and salt mist	IEC60068-2-52, test Kb/VDA 621-415 [1)]
Conducted LF immunity	IEC 61000-4-16
Conducted RF immunity	IEC 61000-4-6
EFT immunity	IEC 61000-4-4
Surge immunity	IEC 61000-4-5
ESD immunity	IEC 61000-4-2
Dielectric tests	IEC 60947-2
Conducted emissions	CISPR 22 [2)]
Radiated emissions	CISPR 22 [2)]
RF field immunity	IEC 61000-4-3
Insulation resistance	IEC 60092-504
Power supply short term variation immunity	IEC 61000-4-11
Power supply failure immunity	IEC 61000-4-11/IEC 60092-504

1) Only with the outdoor enclosure.
2) Limits according to IEC 60945.

Environmental and electrical specifications are valid only for the AWS430 main unit. For the sensor specifications, see the sensor datasheets.

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