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DATASHEET

WMT700

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VAISALA

WINDCAP® Ultrasonic Wind Sensor WMT700 Series



WMT700 Series has been designed for professional use in meteorology, aviation, maritime, wind energy, and many other applications.

Vaisala WINDCAP® Ultrasonic Wind Sensor WMT700 Series is a robust and reliable ultrasonic anemometer. It measures surface wind, which is one of the key parameters for meteorology and aviation.

WMT700 series meets WMO CIMO Guide (WMO-No.8) and ICAO requirements.

Features

- Measurement range up to 90 m/s (201 mph)
- 3-transducer layout (6 measurement paths) and WINDCAP® technology provide accurate data
- Large transducers provide high ultrasound power
- Fully compensates effects of temperature, humidity, and pressure
- Data output rate 4 Hz and 8 Hz
- Stainless steel structure
- Maintenance-free
- Heating up to 250 W
- IP66 and IP67
- WMO and ICAO compliant
- Wind gust calculated according to WMO guidelines
- US National Weather Service and the FAA rely on Vaisala WINDCAP® technology

Accurate and maintenance-free

WMT700 series has a durable full steel structure with welded arms, clear North indication, and one-point, quick bayonet-style mounting. It has no moving parts, and it is resistant to contamination and corrosion.

It measures accurately and produces reliable data in demanding wind conditions and climates without periodic or on-demand maintenance. Self-diagnostics and measurement validation are standard features. The 60-minute average is available for polar coordinates and vectors.

Measurement based on ultrasound

WMT700 series uses ultrasound to determine the horizontal wind speed and direction. The measurement is based on transit time, the time it takes for the ultrasound to travel from one transducer to another, depending on the wind speed.

The transit time is measured in both directions for a pair of transducer heads. Using 2 measurements for each of the 3 ultrasonic paths at 60° angles to each other, WMT700 computes the wind speed and direction.

The wind measurement is calculated in a way that completely eliminates the effects of altitude, temperature, and humidity.

Standard and heated models

WMT700 series operates with a power supply of 9–36 V DC. For the heated model, an additional heating power supply of 24–36 V DC is required.

Thermostatically controlled heaters in the transducer heads and arms of the heated model prevent buildup of freezing rain and snow. A model with a heated transducer, arms, and body is available for operation in the harshest and coldest environments.

Accessories

Accessories are available for mounting and connecting WMT700. To minimize interference from birds, a bird prevention kit is available. In addition to the standard detachable cable, WMT700 is also available with an integrated hybrid cable designed particularly for harsh installation environments.

TYPE APPROVED PRODUCT
DNV·GL
DNVGL.COM/AF

DNV GL TYPE EXAMINATION CERTIFICATE No. TAA00000U5

SGS
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Technical data

Wind speed measurement performance

Observation range	WMT701: 0–40 m/s (89 mph) WMT702: 0–65 m/s (145 mph) WMT703: 0–75 m/s (168 mph) WMT704: 0–90 m/s (201 mph)
Starting threshold	0.01 m/s (0.0223 mph)
Resolution	0.01 m/s (0.0223 mph)
Response time	250 ms
Accuracy	0–75 m/s (168 mph): ±0.1 m/s (0.2 mph) or 2 % of reading, whichever is greater 75–90 m/s (201 mph): ±5 % of reading

Wind direction measurement performance

Observation range	0–360°
Starting threshold	0.1 m/s (0.2 mph)
Resolution	0.01°
Response time	250 ms
Accuracy	±2°

Powering specifications

Operating voltage	9–36 V DC (absolute max. 40 V DC) [1]
Heating voltage	24–36 V DC (absolute max. 40 V DC) [1]
Heating power supply requirement [2]	
Heated transducers	Average 32 W Peak 40 W
Heated transducers and arms	Average 152 W Peak 200 W
Heated transducers, arms, and body	Average 252 W Peak 350 W at 24 V DC

1) *In maritime environments, the normal input voltage ranges are: operating voltage 12–30 V DC (–25 … +30 %) and heating voltage 24–30 V DC (–25 … +30 %), as defined in the maritime standard IEC 60945.*
2) *The actual power consumption depends on the temperature.*

Messaging specifications

Readout update interval	4 Hz (default) and 8 Hz (optional)
Units available	m/s, knots, mph, km/h, V, mA, Hz
Operating mode	Automatic message or poll mode
Sonic temperature	Celsius degrees
Data format outputs	Polar coordinates and vectors

Mechanical specifications

Dimensions (H × W × Ø [1])	348 × 250 × 285 mm (13.70 × 9.84 × 11.22 in)
Weight	1.8 kg (4.0 lb)
Materials	
Body and arms, mounting kit	Stainless steel AISI 316
Transducers	Silicone
Connector housing surface	Nickel-plated brass

1) *Diameter of area covered by transducers.*

Analog outputs

Wind speed	Voltage, current
Wind direction	Voltage, current

Operating environment

Heating [1]	0 W, 30 W, 150 W, or 250 W
Operating temperature [1]	–10 … +60 °C (+14 … +140 °F) –40 … +60 °C (–40 … +140 °F) –55 …+70 °C (–67 …+158 °F)
Storage temperature	–60 … +80 °C (–76 … +176 °F)
IP rating	IP66 IP67

1) *For freezing conditions, select appropriate combination of heating and temperature ranges.*

Digital outputs

Communication interfaces	COM1: RS-485 COM2: RS-485, RS-422, RS-232, SDI-12
Communication profiles	WMT700, WS425 ASCII, NMEA Standard and Extended (version 0183), SDI-12 (version 1.3), WS425 ASOS, ROSA MES 12, customized
Bit rate	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200
Available averages	Max. 3600 s

Compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863 REACH Regulation (EC 1907/2006)
EMC immunity	IEC 61326-1:2013, IEC 60945
EMC emissions	CISPR 32 / EN 55032, Class B
Environmental	IEC 60068-2-1, 2, 6/34, 30, 31, 67, 78, IEC 60529 VDA 621-415
Maritime	IEC 60945:2002 + IEC 60945/ Cor1:2008, DNVGL-CG-0339
Safety	UL 61010-1 CAN/CSA C22.2 No. 61010-1-12
Application standards	EN 15518-3:2023, Winter maintenance equipment - Road weather information systems - Part 3: Requirements on measured values of stationary equipment
Compliance marks	CE, China RoHS, RCM, UKCA
Listing marks	SGS (USA and Canada) [1]

1) *Not applicable to the integrated cable.*

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