

Anemometer Thies First Class Advanced X

Intelligent optically-scanned cup anemometer



Description

- Intelligent optically-scanned cup anemometer

Thies First Class Advanced X is classified acc. to IEC 61400-12-1 Ed. 2.0 (2017-03). It has been designed to measure:

- Horizontal wind speed
- Absolute and relative air pressure
- Inclination X, Y and Z
- Acceleration, frequency and amplitude of vibration measurement in X, Y and Z

The anemometer is designed for measuring of wind resources for assessment reports and power curves. The sensor is characterized by minimal deviation from cosine line, optimized dynamic behavior even at highly intense turbulences, minimal overspeeding, low starting value and optimized oblique inflow behavior. It requires only low maintenance thanks to its low-inertia and ball-bearing cup star. For winter operation the electronically regulated heating guarantees smooth running of the ball bearings and prevents icing of shaft and slot.

Specifications

Specification

Characteristics	
Physical functionality	Optically-scanned cup anemometer
Delivered signal	Frequency output (pulse) and RS485 (Modbus)
Accuracy	
Accuracy wind speed	$\pm 1\%$ of measured value or $< \pm 0.2$ m/s @ 0.3 ... 50/s
Accuracy housing temperature	$\pm 1^\circ$ (Measurement range: $-40 \dots +80$ °C)
Accuracy air pressure	± 1 hPa @ 20°C (Measurement range: 300 ... 1100 hPa)
Accuracy inclination [X, Y, Z]	$\pm 1^\circ$ (Measurement range: $-89.9^\circ \dots +89.9^\circ$)
Accuracy vibration [X, Y, Z]	± 0.4 Hz (Measurement range: 0 ... 50 Hz)
Accuracy acceleration	± 30 mg (Measurement range: ± 8 g)
Linearity	Correlation factor r between frequency f and wind speed y $r > 0.999\ 99$ [4 ... 20 m/s]
Starting velocity	< 0.3 m/s
Resolution	0.05 m wind run
Distance constant	< 3 m (acc. to ASTM D 5096 - 96) 3 m acc. to ISO 17713-1
Turbulent flow into cups	Deviation Δv turbulent compared with stationary horizontal flow $-0.5\ \% < \Delta v < +2\ \%$ Frequency < 2 Hz
Wind load	Approx. 100 N @ 75 m/s
Operating range	
Measuring range	0.3 ... 75 m/s
Survival speed	80 m/s (mind. 30 min)
Permissible ambient conditions	$-40 \dots +80$ °C, 0 ... 100% RH including condensation
Electrical data	
Output signal (frequency)	Form rectangle, 1090 Hz @ 50 m/s, supply voltage max. 15 V
Output signal (RS485)	Modbus protocol, bus-compatible Half duplex, data format: 8N1 Baud rate: 2400, 4800, 9600, 19200, 38400, 57600
Electrical supply for optoelec. scanning	Voltage: 3.7 ... 42 VDC (galvanic isolation from housing) typically 40 mA, max. 100 mA
Electrical supply for heating (only S11200H)	Voltage: 24 V AC/DC (galvanic isolation from housing) Idling voltage: max. 30 VAC, max. 42 VDC Power consumption: 25 W
General	
Connection	8-pole plug-connection for shielded cable in the shaft
Mounting	on mast tube R1
Dimensions	290 x 240 mm
Fixing boring	35 x 25 mm
Weight	approx. 0.5 kg
Material	Housing: Anodised aluminium Cup star: Carbon-fibre-reinforced plastic
Type of bearings	Metallic ball bearings
Protection	IP 55 (DIN 40050)
Patent	EP 1 398 637, DE 103 27 632, EP 1 489 427
EMC	EN 61000-6-2, EN 61000-6-3, EN 61010-1, EN 50581
Manufacturer	Thies
Accessory	Module set M83575 (incl. isolated repeater)

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Sensor connection diagram

Sensor connection diagram to Ammonit Meteo-40 data logger

