Wind Vane Thies First Class POT active (electronic) S21220

- **Improved version of First Class wind vane**
- **Robust wind vane for highest demands**
- **No wear of the potentiometer due to mechanical stress**

Measurement principle

The electronic emulates the behaviour of a mechanical potentiometer but avoids the wear and aging of the mechanical devices.

Wiring is compatible to the classic potentiometer wind vane to keep the high precision measuring constellation of the potentiometric wind vane when Ammonit Meteo-40 data logger is used.

The wind vane is available with an electronically regulated heating system in order to prevent ice from the bearings. To use this heating the connection cable must have additional cores and you should provide a sufficient power supply (mains connection).

Heating

The surface temperature of housing neck is >0 °C at 20 m/s up to -10 °C air temperature. At 10 m/s up to -20 °C the Thies icing standard 012002 on the housing neck is applied. The heating is regulated with a temperature sensor.

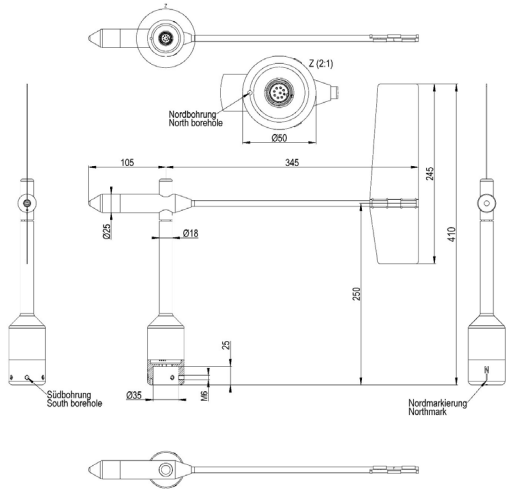
Mounting

Mount the wind vane onto a pipe socket of 1" (Ø 33.4 mm) and a length of at least 25 mm. The pipe socket must have an inner diameter of at least 25 mm depending on the plug. The wind vane is connected electrically with a plug. Set the sensor onto the pipe socket, and fix it on the mast or tube (2x M6 Allen head screws, female hexagon).

To avoid damage due to lightning, a protection rod, adapters of POM for isolated mounting and proper grounding of all metal parts is recommended.

Refer to the next page for connection recommendations for the cable shield.

Dimensional drawing



Maintenance

When installed properly, the wind vane operates almost maintenance-free thanks to its integrated ball bearings.

Dust or dirt may clog the space between the rotating parts and the shaft. Therefore you should check the plausibility of your measurements at regular terms and clean the device, if necessary.

In long-term operation (years) the bearings may be subject to wear and tear showing delayed start-up behaviour or even stand-still of the vane.

Should such a defect occur we recommend returning the instrument for repair.

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Specifications

Characteristic	Description / Value		
Measuring principle	Tunnel Magneto Resistance (TMR) sensor		
Measuring range	0 ... 360°		
Measuring accuracy	±1°		
Operating speed	up to 75 m/s		
Survival speed	85 m/s to 0.5 h (without damages)		
Wind Load	64.5 N		
Linearity	<0.25 % (1°)		
Starting threshold	< 0.5 m/s at 10° amplitude (acc. to ASTM D 5366-96) < 0.2 m/s at 90° amplitude (acc. to VDI 3786 Part 2)		
Delay distance	< 1.8 m (acc. to ASTM D 53666-96)		
Damping ratio	D > 0.3 (acc. to ASTM D 53666-96)		
Quality factor	K > 1		
Electrical supply	Voltage VCC	3,3 ... 12 VDC (continuous voltage supply) Remark: A pulsed power supply is not possible.	
	Current	0,4 mA @ 3,3 V	0,5 mA @ 5 V
		0,8 mA @ 10 V	0,9 mA @ 12 V
Output voltage	0 V ... VCC The output voltage is proportional to the supply voltage and the angle of the vane and therefore shows the same behavior as the wind direction sensor with a mechanical potentiometer.		
Heating	The heater keeps the surface temperature of the housing neck > 0°C. Air temperature -10 °C up to 20 m/s. Air temperature -20 °C up to 10 m/s. Using the Thies icing standard 012002 on the housing neck. Heating regulated with a temperature sensor.		
Ambient temperature	-50 ... +80 °C (all occurring conditions of relative humidity incl. dew moistening)		
Connection	8-pole plug connection for shielded cable in the shaft		
Mounting on mast	Outer diameter ≤ 34mm Inner diameter ≥ 20mm Remark: Mounting on other mast diameters is possible with separate adapters.		
Material	Aluminium		
Type of bearings	Metallic ball bearings		
Weight	approx. 0.7 kg		
Protection	IP 55 (DIN 40050)		
Manufacturer	Adolf Thies GmbH & Co. KG		

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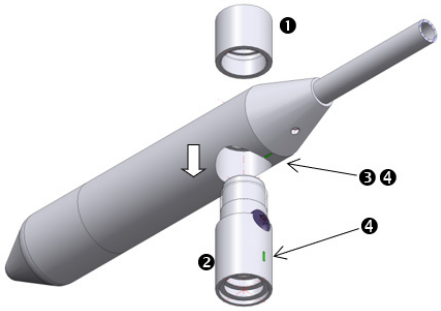
Wind Vane Mounting

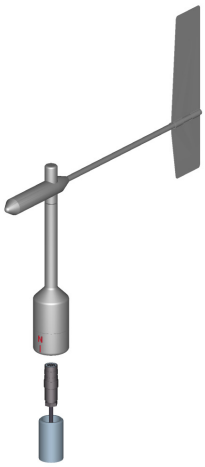
Before the wind vane can be installed at its selected site, the wind vane must be mounted on the housing.

Tools are not required.



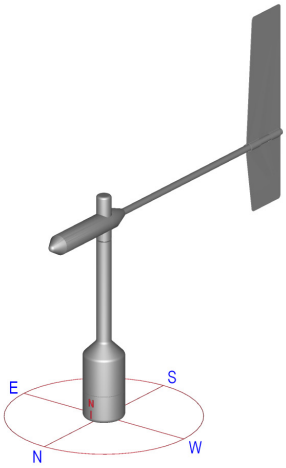
1. Remove the wind vane housing from the packaging
2. Remove cap (1) by left-hand rotation of upper part (2) of wind transmitter shaft.
3. Put the wind vane onto the upper part of the wind transmitter shaft.
   Remark: The longer part of the wind vane blade must indicate upwards.
4. Keep hold of the wind vane by hand to avoid twist movement, and turn the upper part of the wind transmitter shaft until the vane locks into the forcible control (3).
   Remark: The marking lines (4) at the bottom of wind vane counter weight, and at the upper part of the wind transmitter shaft, must be aligned.
5. Put the cap onto the thread, and seize strongly by clockwise rotation by hand.

Mechanical Mounting and alignment



Tools: Hexagon socket wrench size 3 (Allen key).

1. Push cable/ plug connector of the wind direction transmitter through the borehole of the mast, tube, arm etc.
2. Put wind direction transmitter on mast, tube, arm etc.
3. For the precise determination of the wind direction the wind direction transmitter must be aligned northwards (geographical north).
   The north point (0 °) is at the point where the output signal jumps from the maximum value to the minimum value.
4. Rotate north marking (I) at the housing and wind vane axially one above the other, acc. to figure.
5. Determine a prominent spot in the surrounding area (tree, building etc.) in northward direction, by means of a compass.
6. Locate the prominent spot over wind vane and balance weight of the wind direction transmitter.
7. Align wind direction transmitter. The north marking must indicate the *geographical north*.
8. In case of conformity, safeguard the wind direction transmitter by two M6-Allen head screws.



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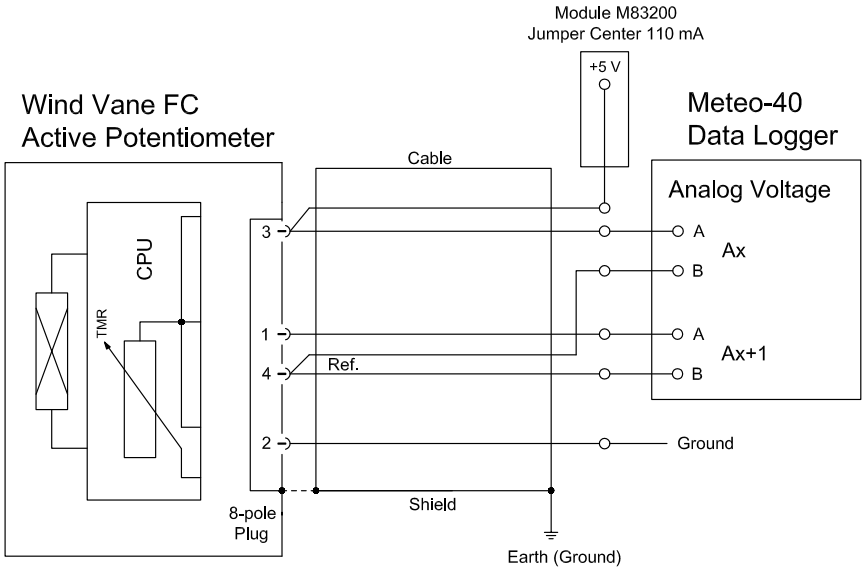
Sensor connection to Ammonit Meteo-40 data logger

Sensor	Plug Pin No.	Ammonit Cable Wire Colour	Meteo-40 Analog Voltage	Supply Sensor
Supply Sense	3	white	Ax	
Ground	4	blue	Bx	
Wind Direction Data	1	brown	Ax+1	
Ground	4	pink	Bx+1	
Supply	3	red		5 V
Ground	2	black		Main Ground
Heating	7	orange, orange		24 VAC/DC
	8	violet, violet		

Cable type without heating: LiYCY 6 x 0.25 mm²
Cable type with heating wires: LiYCY 10 x 0.25 mm²

Sensor connection diagram to Ammonit Meteo-40 data logger



Connection recommendations for the cable shield

Sensor carrier	Sensor	Shielding / Ground
Metallic met mast, grounded	**Non-isolated** mounting on the met mast (e.g. by using metallic brackets, holders, etc.)	Connect cable shield **only** at the side of the data logger to ground.
Metallic met mast, grounded	**Isolated** mounting at the met mast (e.g. by using non-metallic brackets, holder etc. or metallic brackets, holders etc. with isolated plastic adapters)	Connect cable shield at sensor plug **and** at the side of the data logger to ground.
Metallic met mast, non-grounded	**Non-isolated** mounting on the met mast (e.g. by using metallic brackets, holders etc.)	

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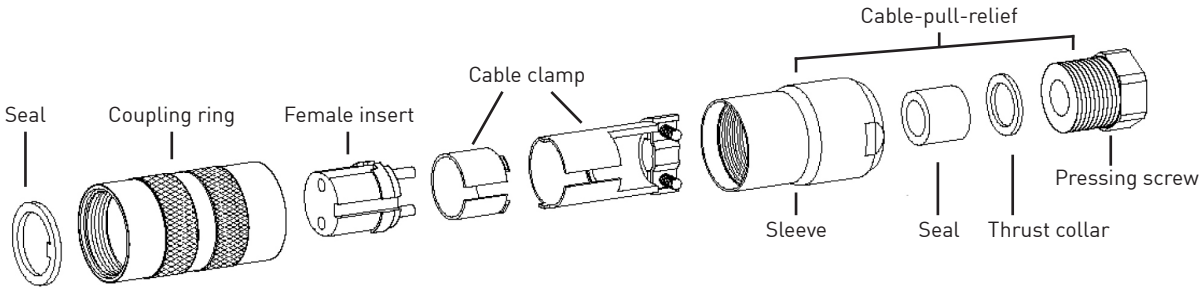
Plug and cable assembly

Coupling socket, Type: Binder, Serial 423, EMC with cable clamp



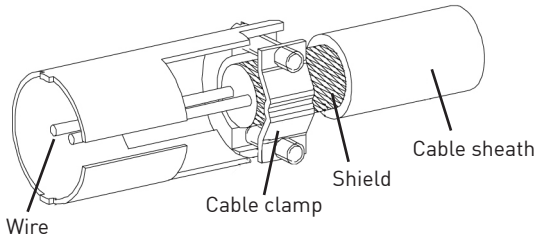
Cable connection: WITH cable shield

1. Stringing parts on cable acc. to plan given above.
2. Stripping cable sheath 20 mm
   Cutting uncovered shield 15 mm
   Stripping wire 5 mm

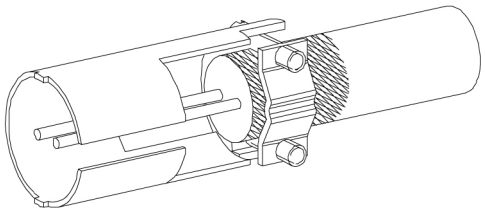
   A) Putting shrink hose or insolation tape between wire and shield

   B) If cable diameter permits, put the shield backward on the cable sheath.
3. Soldering wire to the insert, positioning shield in cable clamp.
4. Screwing-on cable clamp.
5. Assembling remaining parts acc. to plan above.
6. Tightening pull-relief of cable by screw-wrench (SW16 and 17).

A)

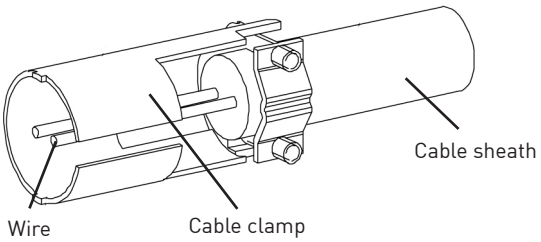


B)



Cable connection: WITHOUT cable shield

1. Stringing parts on cable acc. to plan given above.
2. Stringing cable sheath 20 mm
3. Cutting uncovered shield 20 mm
4. Stripping wire 5 mm
5. Soldering wire to the insert.
6. Positioning shield in cable clamp.
7. Screwing-on cable clamp.
8. Assembling remaining parts acc. to plan above.
9. Tightening pull-relief of cable by screw-wrench (SW 16 and 17).



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