

# WIND VANE

*THIES FIRST CLASS 2014*



ORDER - N°	ELECTRICAL OUTPUT	ELECTRICAL SUPPLY	HEATING SUPPLY	MODEL IN EOL MANAGER
4.3151.00.012	Pot: 2 kΩ Series R: 50 Ω	4...42 VDC current: $\leq U_s / 2 \text{ k}\Omega$	24 V AC/DC 25 W	<b>THIES 2K</b>
4.3151.00.110	Pot: 10 kΩ Series R: 50 Ω	4...42 VDC current: $\leq U_s / 10 \text{ k}\Omega$	24 V AC/DC 25 W	<b>NRG 200P/THIES 10K</b>
4.3151.00.210	Pot: 10 kΩ	0...30 VDC current: $\leq U_s / 10 \text{ k}\Omega$	24 V AC/DC 25 W	<b>NRG 200P/THIES 10K</b>
4.3151.00.212	Pot: 2 kΩ	0...30 VDC current: $\leq U_s / 2 \text{ k}\Omega$	24 V AC/DC 25 W	<b>THIES 2K</b>
4.3151.10.012	Pot: 2 kΩ Series R: 50 Ω	4...42 VDC current: $\leq U_s / 2 \text{ k}\Omega$	No heating	<b>THIES 2K</b>
4.3151.10.110	Pot: 10 kΩ Series R: 50 Ω	4...42 VDC current: $\leq U_s / 10 \text{ k}\Omega$	No heating	<b>NRG 200P/THIES 10K</b>
4.3151.10.210	Pot: 10 kΩ	0...30 VDC current: $\leq U_s / 10 \text{ k}\Omega$	No heating	<b>NRG 200P/THIES 10K</b>
4.3151.10.212	Pot: 2 kΩ	0...30 VDC current: $\leq U_s / 2 \text{ k}\Omega$	No heating	<b>THIES 2K</b>

### APPLICATION

The wind direction transmitter (wind vane) serves for the detection of the horizontal wind direction in the field of meteorology and the technology of environmental protection.

Special characteristics:

- ▀ High level of measuring accuracy and resolution
- ▀ High damping ratio at a small delay distance
- ▀ Low starting threshold
- ▀ Magnetic coupling, which is free of hysteresis and wear, situated between the axis of vane and potentiometer
- ▀ Electronic protective circuit for the limiting of current and against erroneous connection with model 4.3151.x0.110 and 4.3151.x0.012

Optional, an electronically regulated heating system has been installed for wintertime use of the wind direction transmitter, in order to prevent the ball bearing and the external rotation parts from freezing.

### CONSTRUCTION AND MODE OF OPERATION

The dynamic characteristics of the wind vane are achieved by the aluminum lightweight construction. The co-action of wind vane and balance weight results in a high damping ratio with small delay distance as excellent characteristic of the complete vane.

The axis of the wind vane is running in ball bearings, and is coupled in contact less magnetic manner with the axis of the integrated potentiometer. Thus, clearance and friction in the coupling are avoided and an easy starting is guaranteed.

An AC (or DC) voltage of 24 V is intended for the separate supply of the optional heating. In all probability, the heating guarantees a trouble-free function of the Wind Vane Thies First Class 2014 even under extreme meteorological icing-conditions.

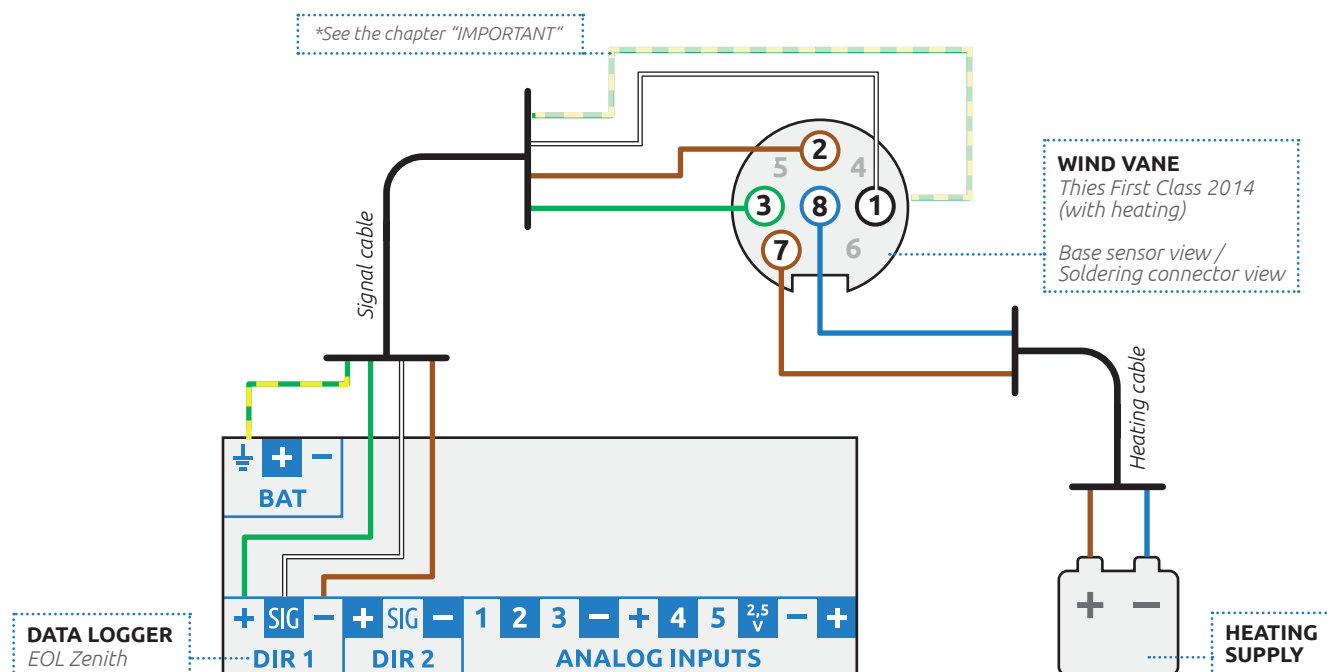
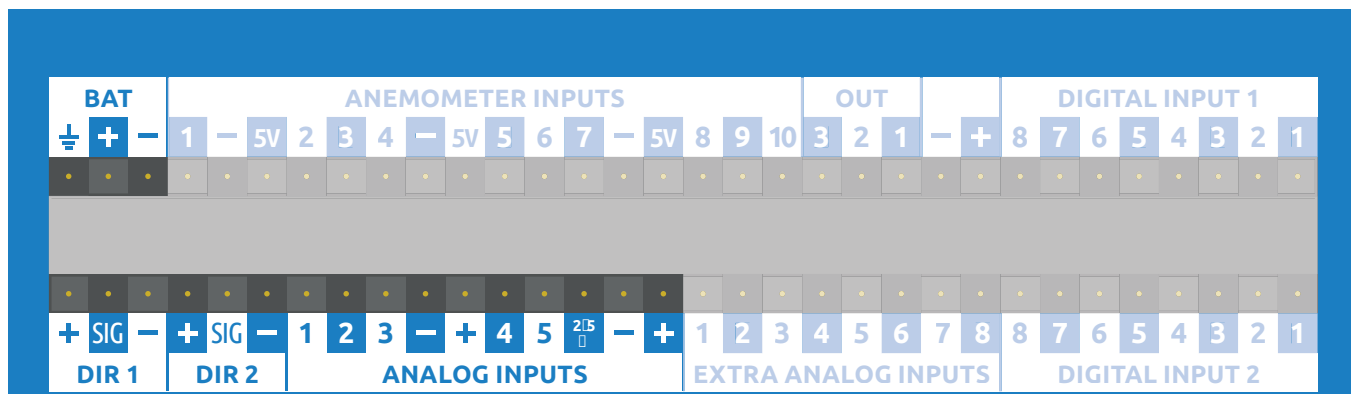
The outer parts of the instrument are made of corrosion-resistant anodized aluminum, and stainless steel. Highly effective labyrinth gaskets and O-rings protect the sensitive parts inside the instrument against humidity and dust.

TECHNICAL DATA

CHARACTERISTIC	DESCRIPTION / VALUE
Measuring range	0...360°
Measuring accuracy	0.25% (1°)
Survival speed	85 m/s up to 30 minutes (w/o damages)
Permissible ambient conditions for operation	-50...+80 °C All occurring situations of r.h. including dew moistening
Electrical output 4.3151.x0.212 4.3151.x0.210	2 kΩ Potentiometer 10 kΩ Potentiometer
Electrical output 4.3151.x0.012 4.3151.x0.110	With electronic protective circuit which circuit avoids an overloading of the potentiometer in case of erroneous connection and on transition 0° → 360° The protective circuit represents a nominal series R=50 Ω. However it limits the short-circuit-current on transition from 0° → 360° (and vice versa) to ≤1 mA at Pot=10 kΩ and ≤2 mA at Pot=2 kΩ
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 536696)
Damping ratio	D>0.3 (acc. to ASTM D 536696)
Quality factor	K>1 $K = \frac{4 \cdot D \cdot \omega_0}{\rho \cdot u}$ D = damping ratio ω <sub>0</sub> = angular frequency of undamped oscillation ρ = air density u = wind speed
Heating	Surface temperature of housing neck >0 °C at 20 m/s up to -10 °C air temperature. At 10 m/s up to -20 °C using the THIES icing standard 012002 on the housing neck heating regulated with temperature sensor
Electrical supply for potentiometer at 4.3151.x0.210 / 212	Voltage U <sub>s</sub> : 0...30 VDC <b>Please maintain a supply current of maximum 20mA – short circuit at the North point</b> (galvanic isolation from the housing) Current: ≤Supply voltage/Potentiometer resistance
Electrical supply for potentiometer with electronic protective circuit at 4.3151.x0.012 / 110	Voltage U <sub>s</sub> : 4 VDC...42 VDC (galvanic isolation from the housing) Current: ≤Supply voltage/Potentiometer resistance ≤1 mA at transition 0° → 360° and 360° → 0° equipped with 10 kΩ Pot ≤2 mA at transition 0° → 360° and 360° → 0° equipped with 2 kΩ Pot Serial R=50 Ω (representative)
Electrical supply for heating	Voltage: 24 V AC/DC, 45...65 Hz (galvanic isolation from the housing) Capacity: 25 W
Weight	ca. 0.7 kg
Protection	IP 55 (DIN 40050)

**INSTRUCTIONS**

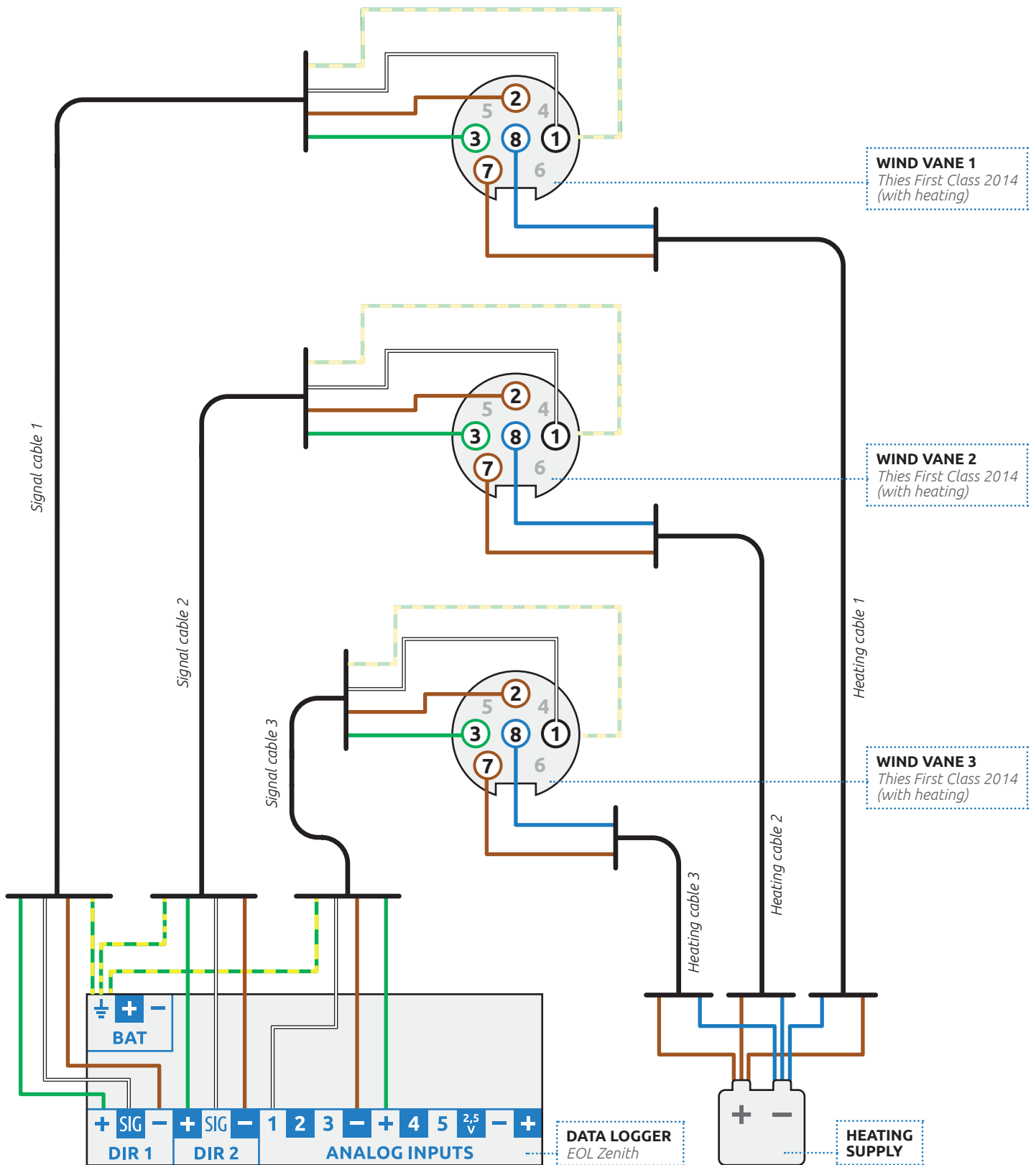
Use the following input channels on the logger to connect this sensor. See highlighted input channels marked here below. The wire colors used in the connection diagram below only applies in case the cable is supplied by Kintech Engineering. For additional wiring & shielding information see the chapter "IMPORTANT" at the end of this dataheet.



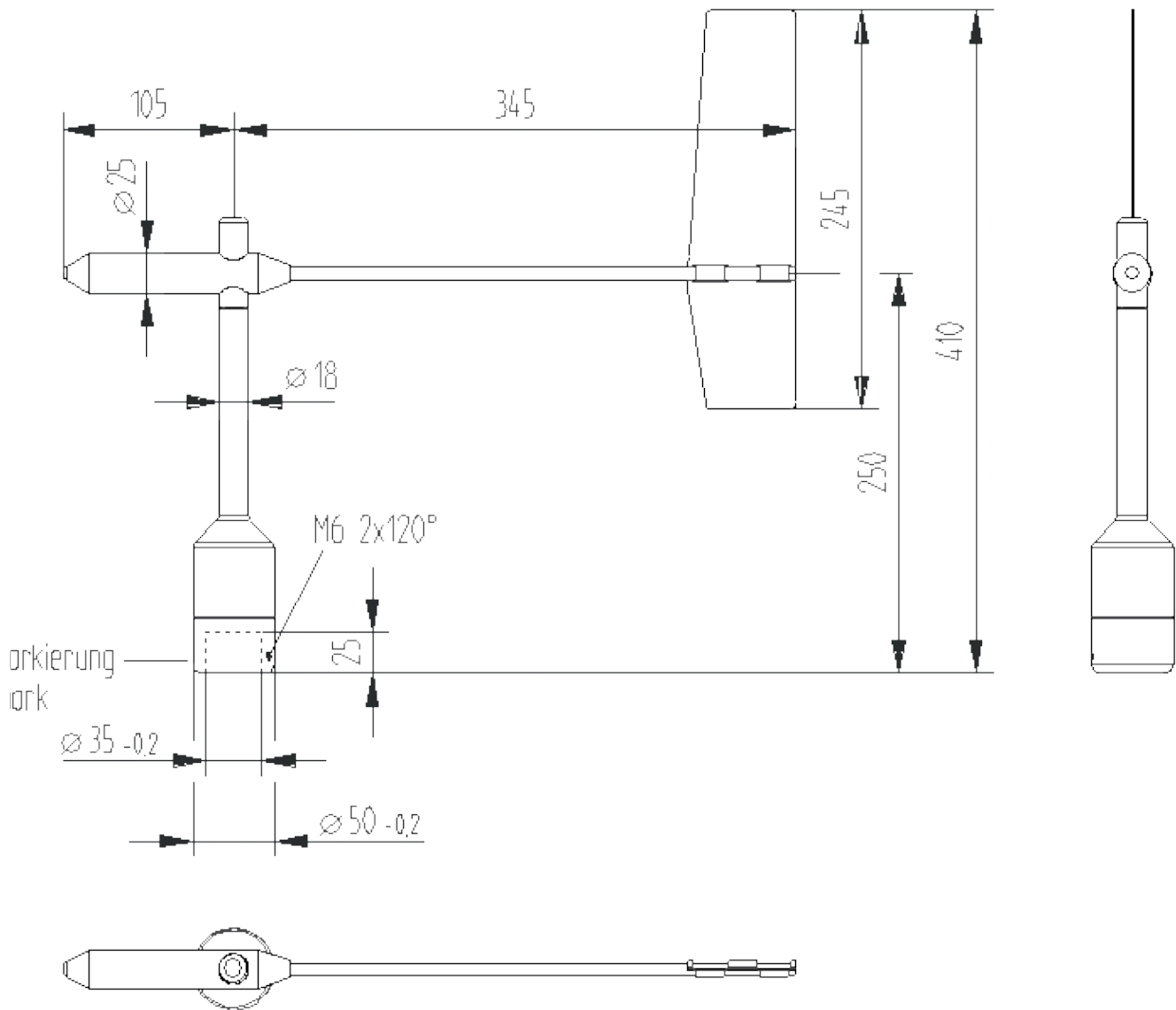
SENSOR PIN DESCRIPTION		DATA LOGGER INPUT CHANNEL		
	1	SIG	DIR 1	SIG
	2	GND	DIR 1	(-)
	3	Us (+)	DIR 1	(+)
	4	<b>Do not connect!</b>		
	5	<b>Do not connect!</b>		
	6	<b>Do not connect!</b>		
	-	Shield	BAT	GND
	7	Heating (+)	Heating Supply	(+)
	8	Heating (-)	Heating Supply	(-)

KINTECH COLOR CODES			
○	White	Signal cable	
●	Brown		
●	Green		
●	Yellow - Green		
●	Brown		Heating cable
●	Blue		

HOW TO CONNECT MORE THAN ONE OF THIS SENSOR (EXAMPLE)



SENSOR DIMENSIONS



## HOW TO CONFIGURE THE SENSOR IN EOL MANAGER

### SENSOR WITH POT = 10K

Open EOL Manager and go to the data logger you are working on. Open the “inputs” tab and select the following type and model:

- ▀ **Section:** Wind Vanes
- ▀ **Type:** Windvane
- ▀ **Model:** NRG 200P/THIES 10K

**Offset value:** Tick the “Std Cal” if the north marking on the wind vane is aligned exactly towards North (in this case the offset is zero (0)). Otherwise the angle (in degrees) must be typed in the offset.

Ignore	Channel	Type	Model	Units	Serial Number	Height	Username	Std Cal	Slope	Offset	Std Dev	Max	Min
<input type="checkbox"/>	D1	Windvane	NRG 200P / THIE...	m		0	Windvane1	<input checked="" type="checkbox"/>	1,000000	0,000000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	D2	Windvane	-----	m		0	Windvane2	<input type="checkbox"/>	1,000000	0,000000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### SENSOR WITH POT = 2K

Open EOL Manager and go to the data logger you are working on. Open the “inputs” tab and select the following type and model:

- ▀ **Section:** Wind Vanes
- ▀ **Type:** Windvane
- ▀ **Model:** THIES 2K

**Offset value:** Tick the “Std Cal” if the north marking on the wind vane is aligned exactly towards North. (In this case the offset is zero (0)). Otherwise the angle (in degrees) must be typed in the offset.



Ignore	Channel	Type	Model	Units	Serial Number	Height	Username	Std Cal	Slope	Offset	Std Dev	Max	Min
<input type="checkbox"/>	D1	Windvane	THIES 2K	m		0	Windvane1	<input checked="" type="checkbox"/>	1,000000	0,000000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	D2	Windvane	-----	m		0	Windvane2	<input type="checkbox"/>	1,000000	0,000000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**IMPORTANT**

- After configuring the sensor in EOL Manager make sure to upload the configuration file to your EOL Zenith data logger. See the "Quick User Guide" how to upload configuration files to the data logger.
- All sensor wire shields must be connected to the data logger GND terminal.
- The data logger should always be connected to a separated ground rod. **Not** to the lightning rod of the tower.
- There are two exclusive inputs in the logger for the wind vanes (DIR1 & DIR2). Connecting the 3<sup>rd</sup> – 7<sup>th</sup> wind vane use "ANALOG INPUTS" of the logger.
- Wind vanes connected to the "ANALOG INPUTS" of the logger must be connected to exclusive (+) and (-) terminals. The terminals (+) and (-) can consequently **not** be shared between wind vanes.
- Wind vanes **cannot** be connected to the "EXTRA ANALOG" channels of the logger.
- To store data such as Std Dev, Max and Min you should tick the corresponding boxes next to each anemometer channel when setting up your site file. Otherwise these parameters will not be stored.

■ Connecting recommendation sensor-shield:

Metallic measurement mast, grounded	Drawing of wind vane incl. isolator 	The shield should be connected to both the anemometer side and the data logger side  Data logger should always be connected to ground
Metallic measurement mast, grounded	Drawing of wind vane <b>without</b> isolator 	The shield should only be connected on the data logger side <b>Not on the sensor</b>  Data logger should always be connected to ground

■ Cable recommendation (up to 100 m cable):

Sensor no heating	Signal cable 3x0.5 mm <sup>2</sup>
Sensor with heating	Signal cable 3x0.5 mm <sup>2</sup>
	Heating cable 2x4 mm <sup>2</sup>

**KINTECH ENGINEERING**

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