

WIND VANE

THIES FIRST CLASS 2014 TMR



ORDER - N°	ELECTRICAL OUTPUT	ELECTRICAL SUPPLY	HEATING SUPPLY	MODEL IN EOL MANAGER
4.3151.00.173	0...5 V	12...24 VDC 4.5 mA + Iout	24 V AC/DC 25 W	OUTPUT 0-5V
4.3151.10.173	0...5 V	12...24 VDC 4.5 mA + Iout	No heating	OUTPUT 0-5V

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

For wintertime use the wind direction transmitter is optionally equipped with an electronically regulated heating, which guarantees the smooth running of the ball bearing, and prevents ice forming in the space between the external rotation parts.

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 carries a diametrically magnetized magnet at the inner end. The angle position of the axis is scanned contact-free by a magnetic angle sensor (TMR-Sensor, Tunnel Magneto Resistance) through the position of the magnet field. As the sensor is operated in magnetic saturation, effects by external magnetic fields can almost be eliminated. The connected electronics calculates the angle position of the axis and provides the respective analogue output signal.

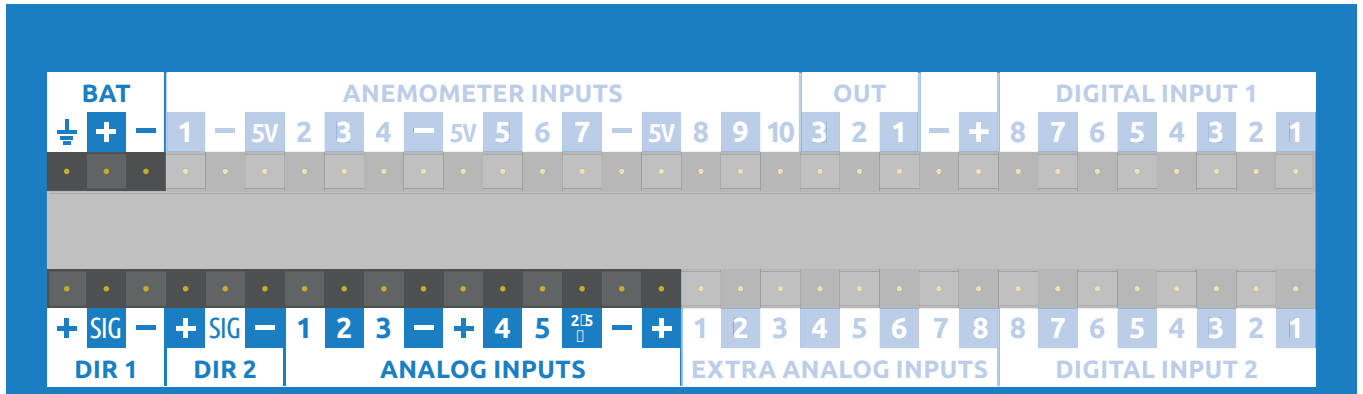
An AC (or DC) voltage of 24 V is intended for the separate supply of the optional heating. In all probability, the heating guarantees a trouble-free function of the wind vane Thies First Class 2014 TMR even under extreme meteorological cing-conditions. The outer parts of the instrument are made of corrosion-resistant 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

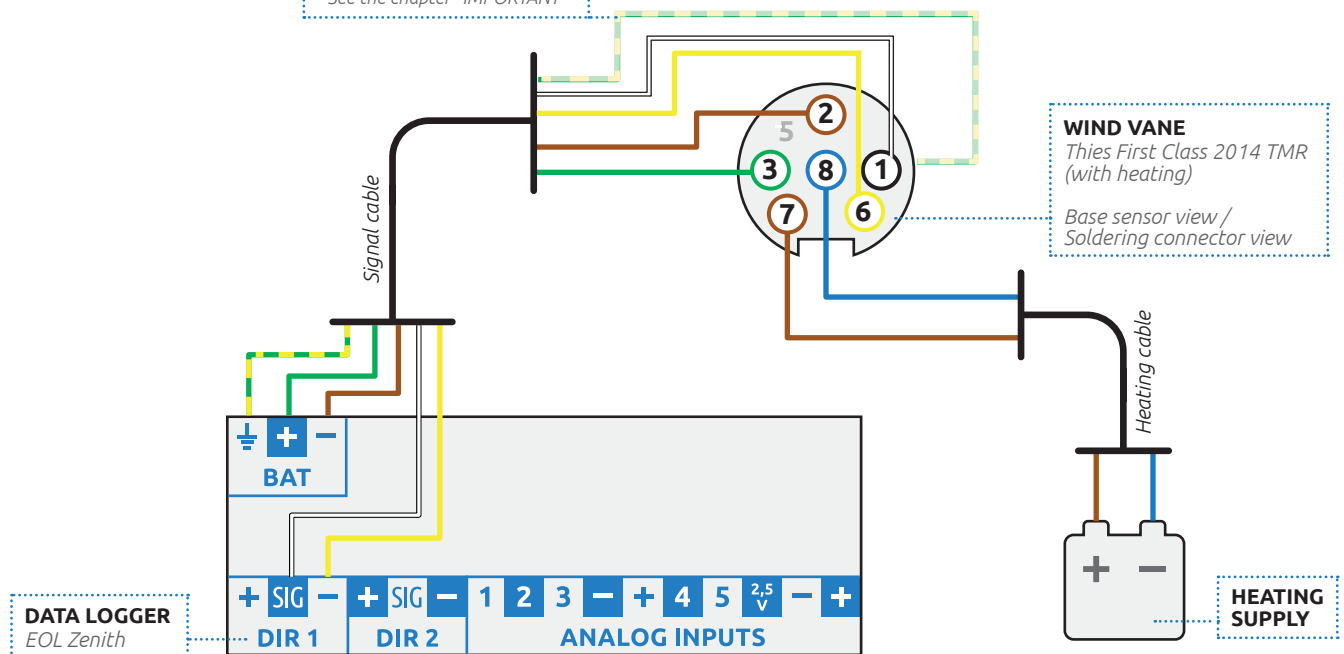
CHARACTERISTIC	DESCRIPTION / VALUE
Measuring range	0...360°
Measuring accuracy	1°
Survival speed	85 m/s up to 30 minutes
Permissible ambient conditions for operation	-50...+80 °C All occurring situations of r.h. including dew moistening
Electrical outputs resolution analogue (10 bit)	0...5 V at 1 kΩ
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 $K = \frac{4 \cdot D \cdot \omega_0}{p \cdot u}$ D = damping ratio ω_0 = angular frequency of undamped oscillation p = 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 electronics (galvanic isolation) 4.3151x0.173	12...24 VDC ca. 4.5 mA + Iout
Electrical supply for heating	Voltage: 24 V AC/DC, 45...65 Hz (galvanic isolation from the housing) Capacity: 25 W
Connection	8-pole plug connection for shielded cable in the shaft
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.



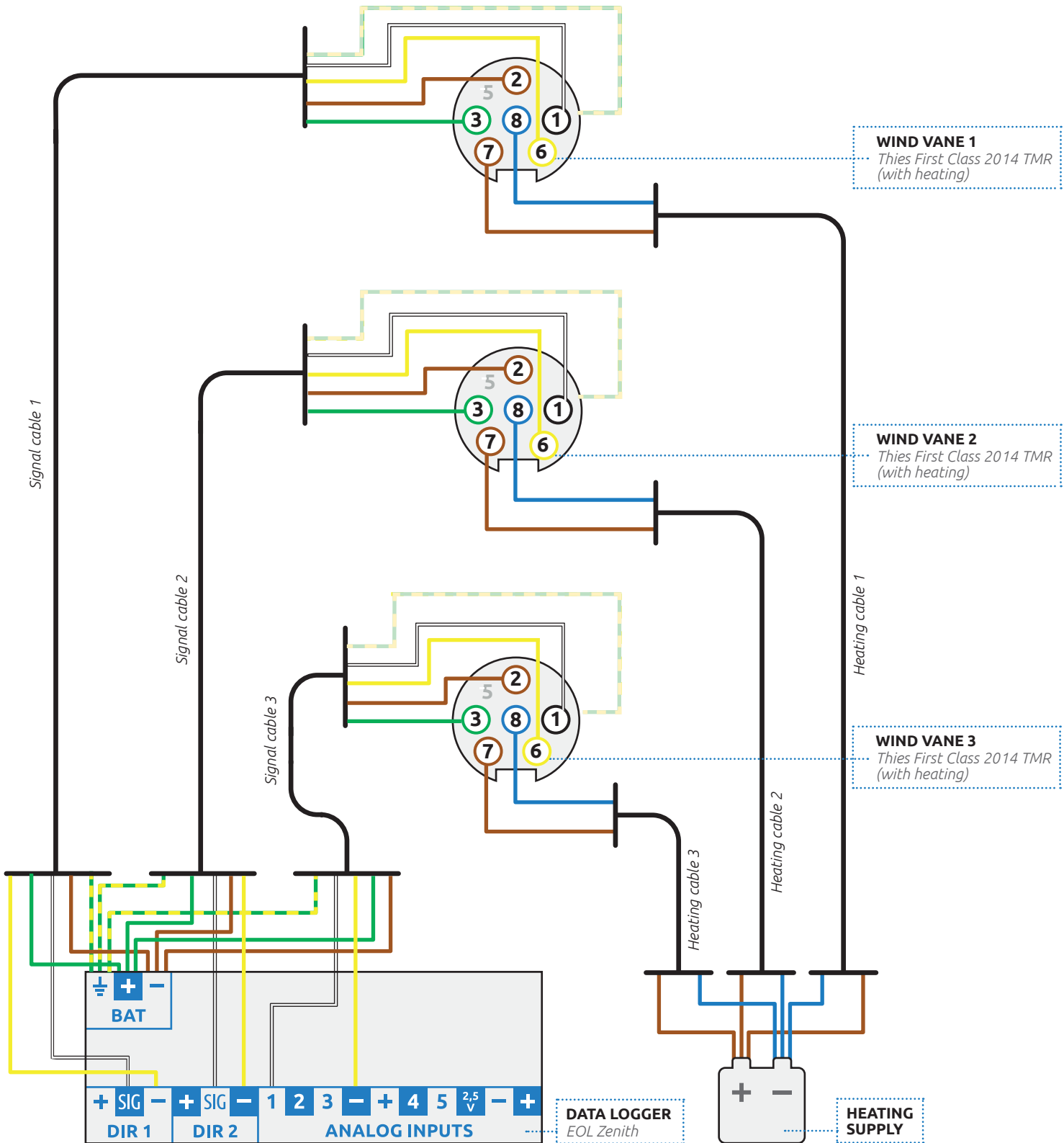
*See the chapter "IMPORTANT"



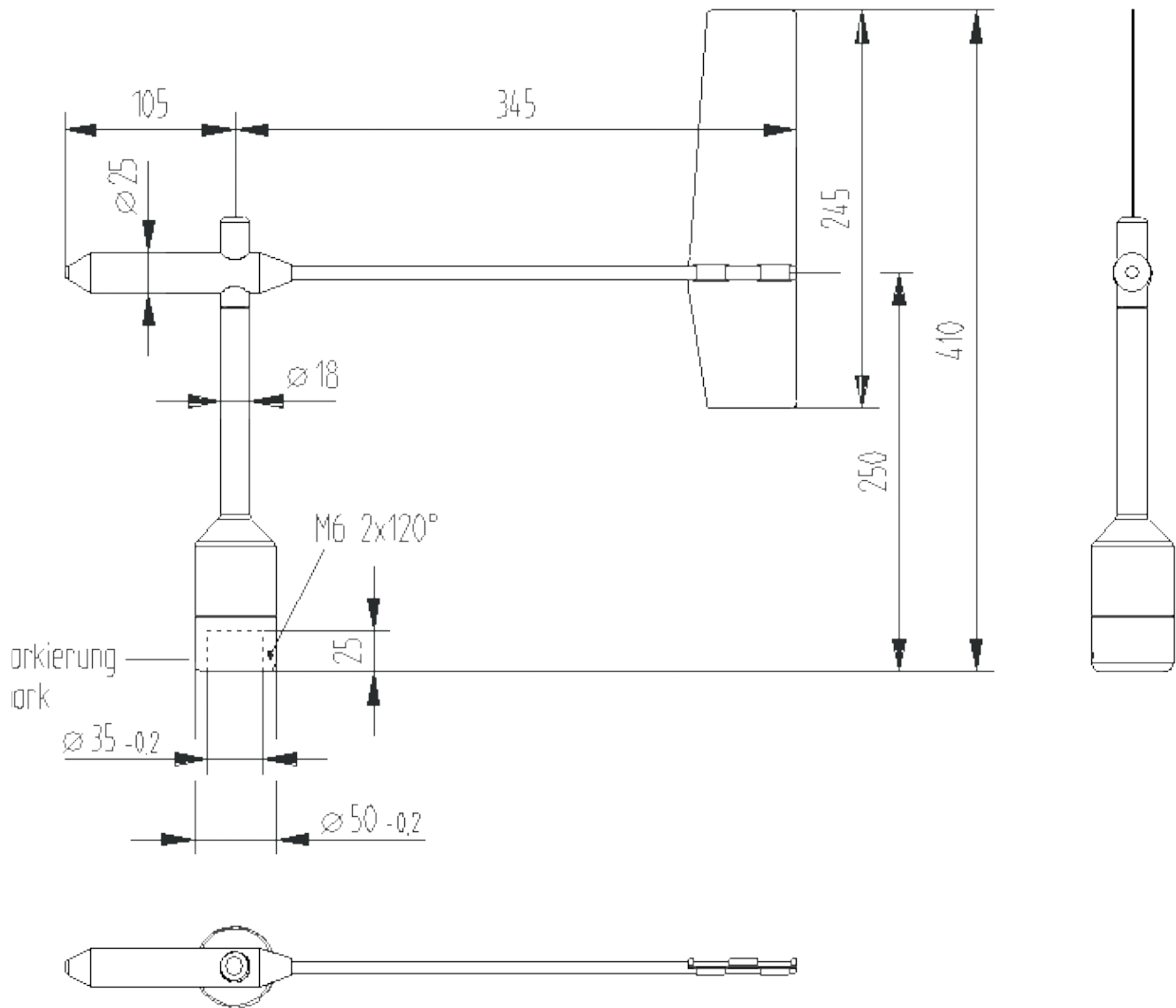
SENSOR PIN DESCRIPTION		DATA LOGGER INPUT CHANNEL		
	1	SIG	DIR 1	SIG
	2	GND	DIR 1	(-)
	3	Us (+)	DIR 1	(+)
	4	Do not connect!		
	5	Do not connect!		
	6	GND	DIR 1	(-)
	-	Shield	BAT	GND
	7	Heating (+)	Heating Supply	(+)
	8	Heating (-)	Heating Supply	(-)

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

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



SENSOR DIMENSIONS



HOW TO CONFIGURE THIS SENSOR IN EOL MANAGER

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: Ouput 0-5V

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	Boom	Username	Std Cal	Slope	Offset	Std Dev	Max	Min
<input type="checkbox"/>	D1	Windvane	Output 0-5V			0	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	-----			0	0	Windvane2	<input type="checkbox"/>	1.000000	0.000000	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SENSOR SELECTION

MODEL SELECTION


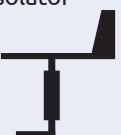
DATASHEET DOWNLOAD

STANDARD CALIBRATION

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 3rd – 7th 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 without isolator 	The shield should only be connected on the data logger side Not on the sensor Data logger should always be connected to ground

Cable recommendation (up to 100 m cable):

Sensor no heating	Signal cable 4x0.5 mm ²
Sensor with heating	Signal cable 4x0.5 mm ²
	Heating cable 2x4 mm ²

Last modified: 18.05.2018

KINTECH ENGINEERING

www.kintech-engineering.com

support@kintech-engineering.com

Tel. +34 976 221 789