Reset when site conditions recover

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

Low wind speeds <3 M/S and moisture can affect the sensors and cause this alarm. Check the site conditions and other turbines to confirm these exist at site. If multiple turbines have this fault or other wind sensor faults and the site conditions are as described, there is little that can be done to resolve the fault until site conditions recover. Continue to reset the turbine as required.

Check amperage rating of FT sensor

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

Check the amperage rating of the FT sensor. Typically the FT sensors supplied have been rated at 4 Amps, however in some sites have received sensors rated at 6 Amps.

If the sensor is rated at 6Amps, measure the voltage on the DC output of AN1:G05 & G06. Adjust the DC voltage to 29VDC by turning the “OUT ADJ” screw on the front of the AN:G05 & G06.

Disconnect and connect sensor plug

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

Disconnect and connect sensor plug.

The connector can easily be mounted incorrectly.

If the cable is mounted tight and it pulls in the sensor connector, it must be connected so that it is not pulling the plug.

Cable plug and protective boot:

Proper instillation of protective boot:

Troubleshoot communication line

Does this solve the problem?

1] Yes

2] No

3] I don't know

- **Explanation**

If the fault is intermittent and occurring often, set up the TAC data-logger to trigger on fault 219 and record wind direction and speed for both sensors. If signal is consistently missing at the exact same time from both sensors then it is likely a problem with communication between the TAC controller and the sensor. Note that signal is naturally intermittent from ultrasonic sensors.

Remove connector on the wind sensors and check for signs of moisture/corrosion/damage.

Check the sensor connection for signs of moisture and corrosion or damage:

If the cable or plug has been damaged or shows signs of corrosion that cannot be repaired, replace the respective cable with a new one; item numbers:(CABLE for FT702/LT 9m)

Relevant spare parts	
Description	**Item No.**
CABLE W583 NM30t	60093757
CABLE W584 NM30t	60093759
CABLE for FT702/LT 9m	60106332

Check the routing of the sensor cables (W583, W584), due to friction with the cooler fittings it can be damaged and in wet or rainy conditions the thermal will trip due to an internal short circuit in the cable:

Identify cause of power loss and repair

Does this solve the problem?

1] Yes

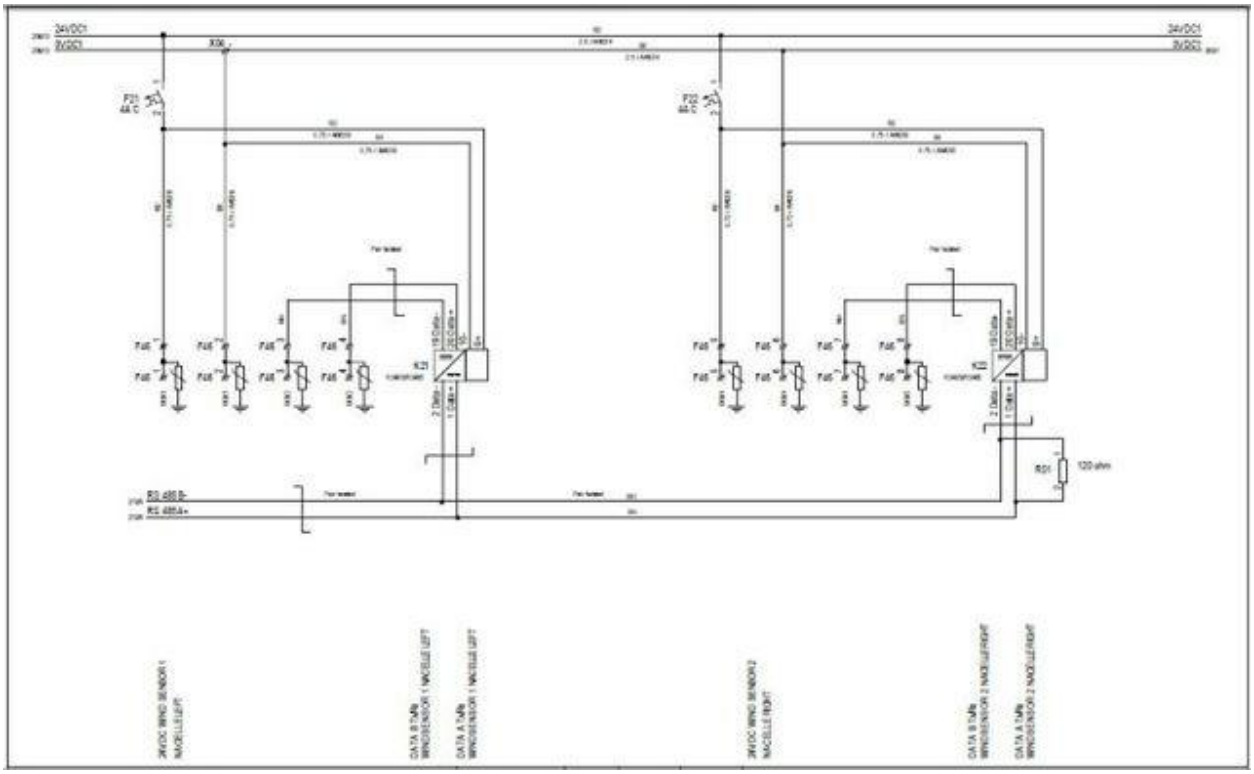
2] No

3] I don't know

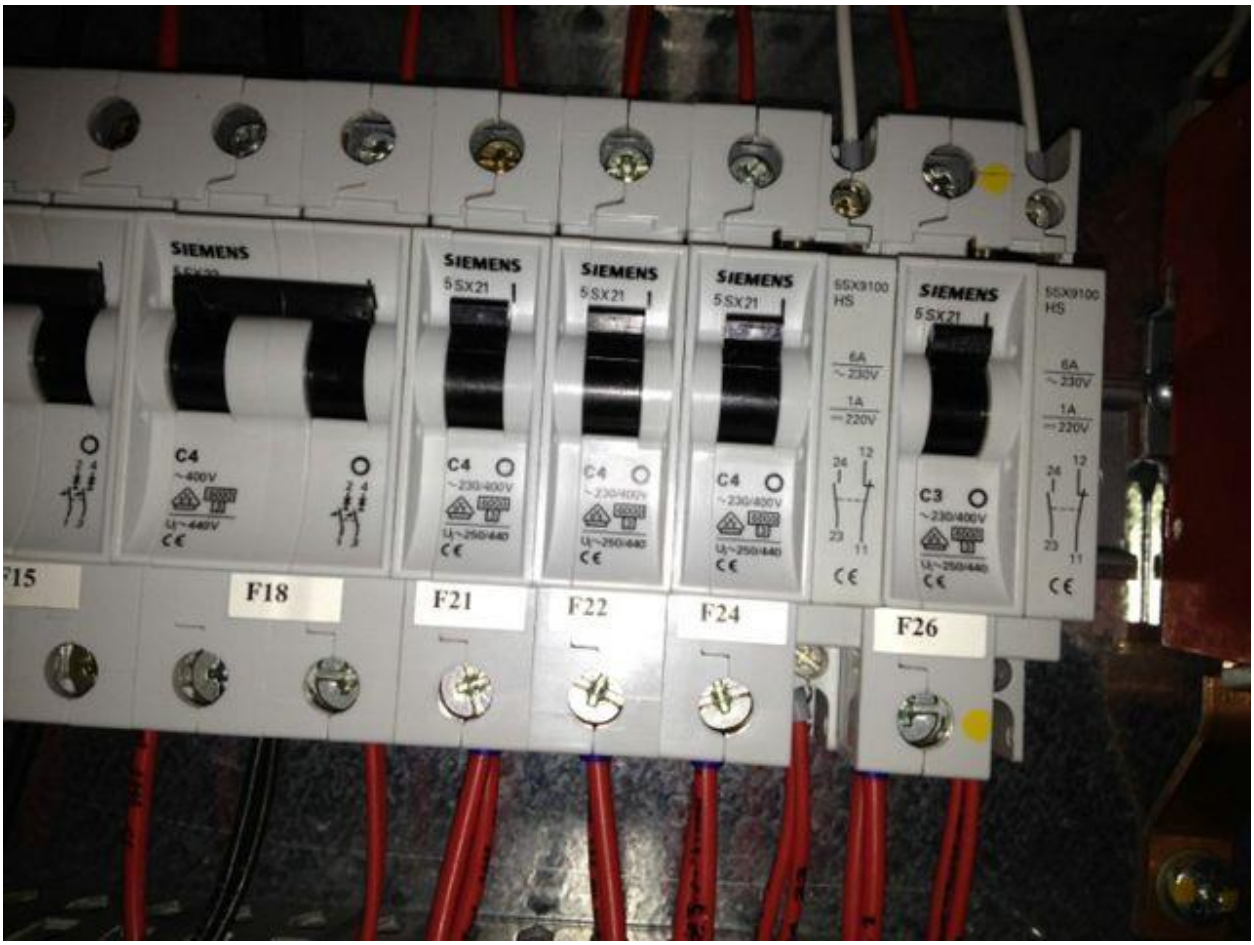
- **Explanation**

Check the circuit breakers F21 (sensor 1) and F22 (sensor 2) in the AN1 panel to see if they are open. In the AN1 measure 230 VAC on G06 Power Net power supply input and observe the green diode light. Measure 24 VDC on the power supply output, check for loose wires.

Circuit:



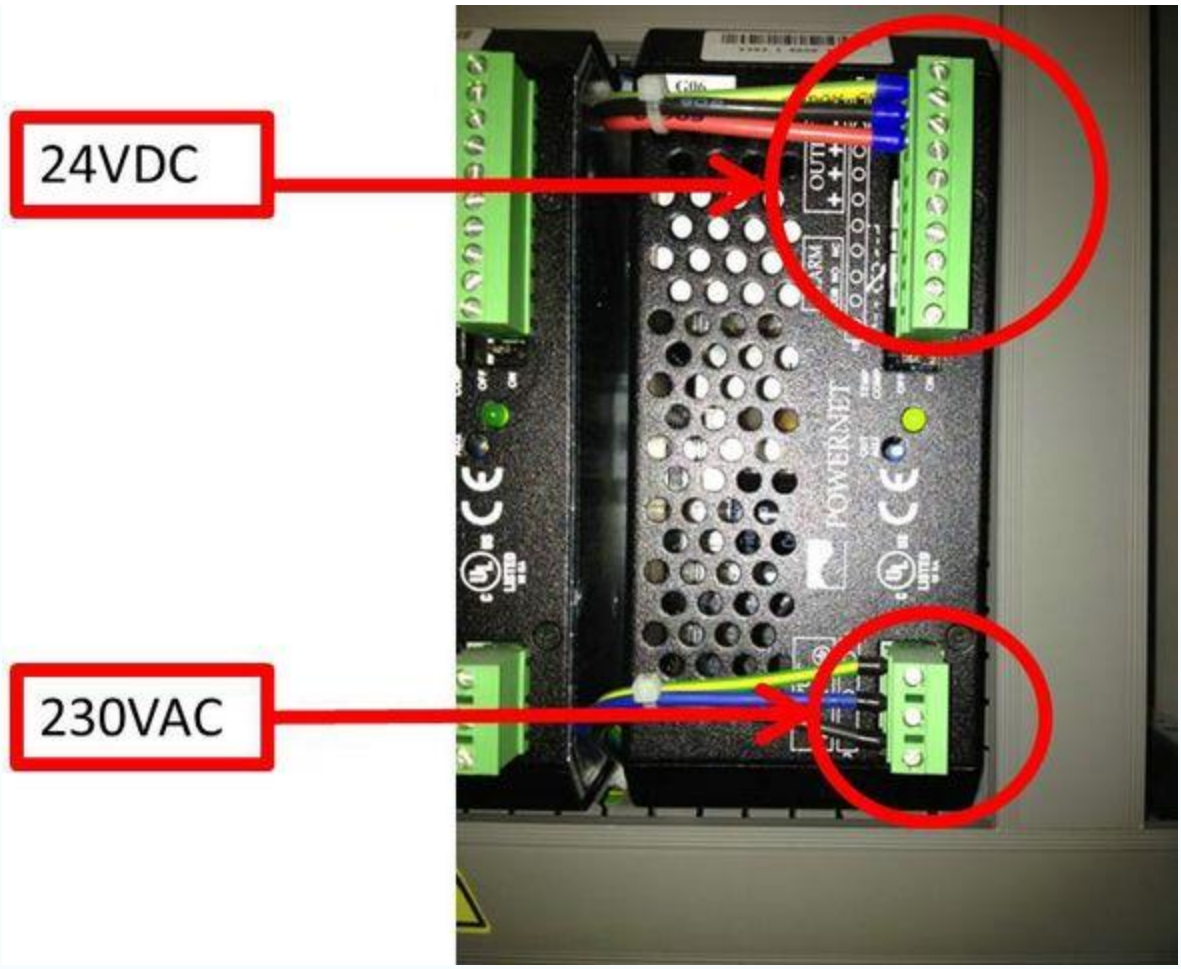
F21 & F22 Circuit breakers in AN1:



If either of the circuit breakers cannot be reset, replace the failed breaker. Item number:

Relevant spare parts	
Description	**Item No.**
MCB 5SX2104-7 4.0A C 1P	60005136

G06 Power Net:



Measure the input and output of the G06. If there is supply voltage but no output voltage and or the LED is out- replace the power supply.

Relevant spare parts	
Description	**Item No.**
PS ADC 5483R-3 10A-27,4 NM PIN	188453

A short circuit in the sensor may cause the 24V output for the sensor to drop. Remove the sensor to see if the voltage recovers. If the sensor is shorted, replace it.

Relevant spare parts	
Description	**Item No.**
WIND SENSOR US FT702LT	60111943

If replacing the FT sensor, ensure that it meets the firmware requirements.

NOTE: To upgrade the sensor firmware, the sensor will be connected directly to a PC with firmware installed from the Vestas Software Portal.

Relevant CIM Case		
CIM Case	**Description**	**Task list**
2675	FT wind sensor with item number 60111943 and 106500 (version 22) with power curve issues and software bug	15955

Relevant documentation	
Description	**DMS No.**
Upgrading FT22 Sensor Firmware	0029-1332

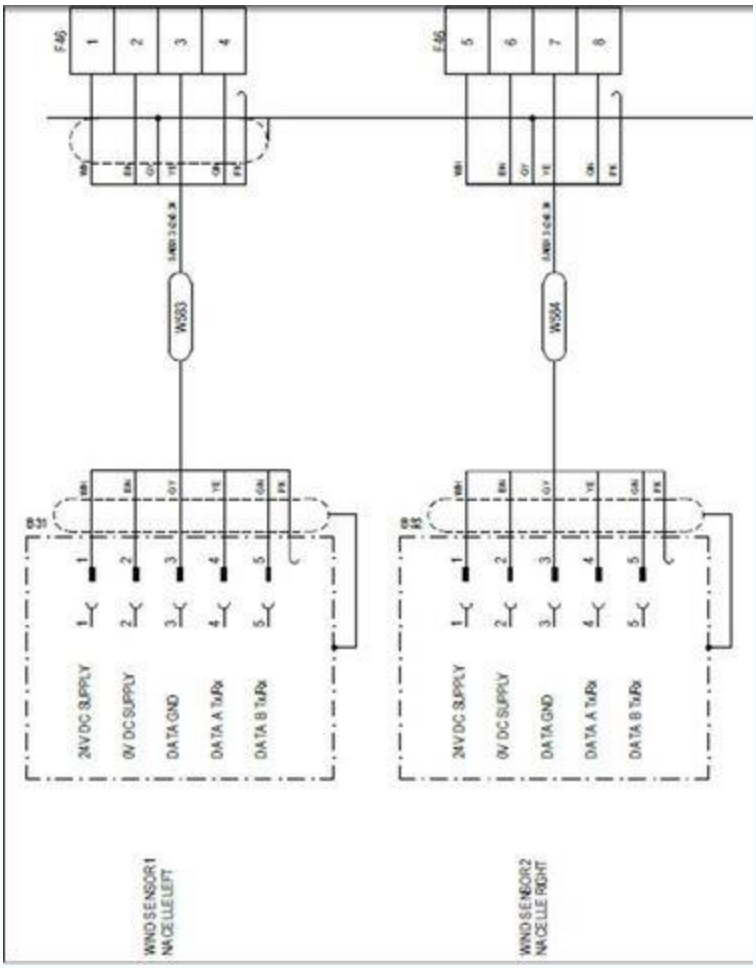
If the FT sensor does not appear to be shorted, check the F46 varistor box for a failed varistor. Remove the wires from the varistor box and remove it from the housing.

Varistor box F46:

Press clip on top and bottom of varistor box and remove varistor assembly from housing:


460
468
468
V38
V39
V40
F41
F42
F43
F44
F45
F46
F47
F48

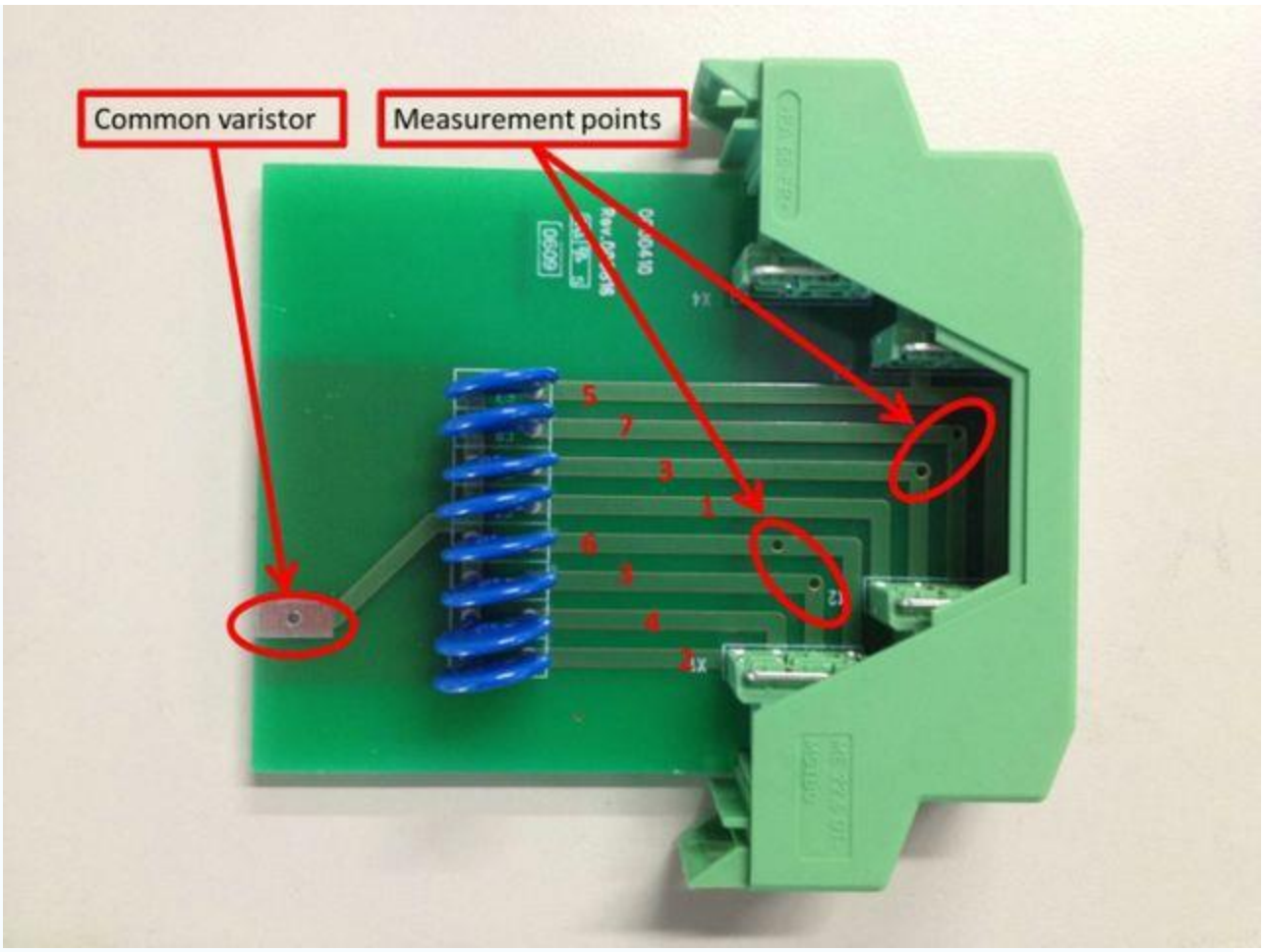
The varistor box is made up of eight varistors and has provisions for 16 wire connections (protection for 8 signals).



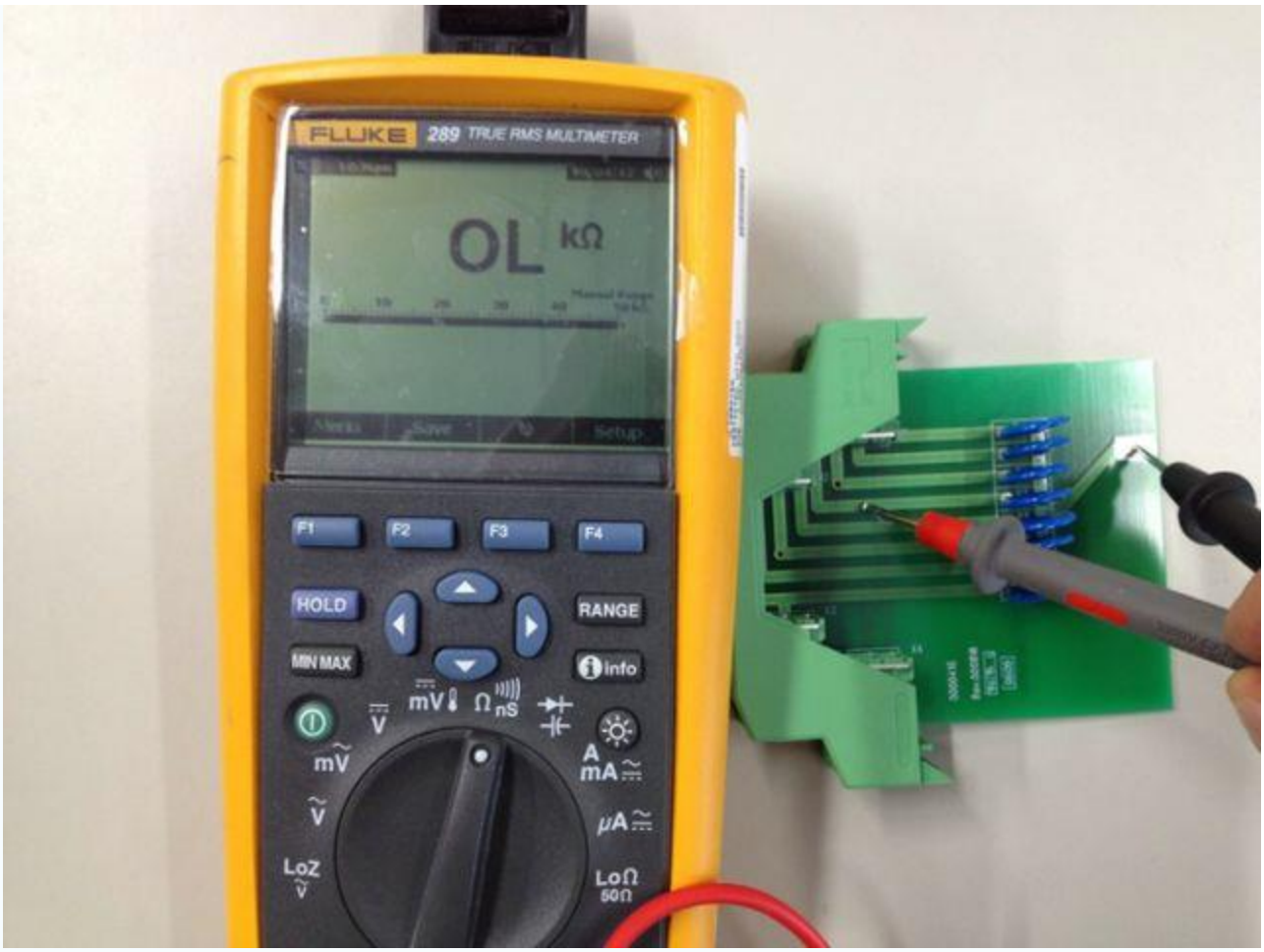
Both wind sensor 1 (left) and wind sensor 2 (right) use varistor box F46. Terminals 1-4 (top and bottom) are for wind sensor 1 and 5-8 (top and bottom) are for wind sensor 2.

Varistors can be tested individually by placing a multimeter (set to measure Ω) lead on the common (earth) side of the varistors and the other on the individual varistor measurement points or at the terminals.

Varistor measurement points:



Measuring resistance across the varistors:



Measure resistance between the common varistor point and all other measurement points. Only four varistors can be measured by using the test points on the board, test the remaining four from the terminals. The resistance value over the varistor should be ∞ or in the high MΩ range. If the resistance is lower, the varistor has been damaged by an over voltage in the circuit and must be replaced.

Relevant spare parts	
Description	**Item No.**
Mounted PCB VARISTOR BOX X8	60015268

The varistor will be damaged by an event and therefore should not be the cause but a consequence of the event. The cause of the failure may be due to lightning, fault in the power supply or short in the circuit.

Identify the cause of communication loss and repair

Does this solve the problem?

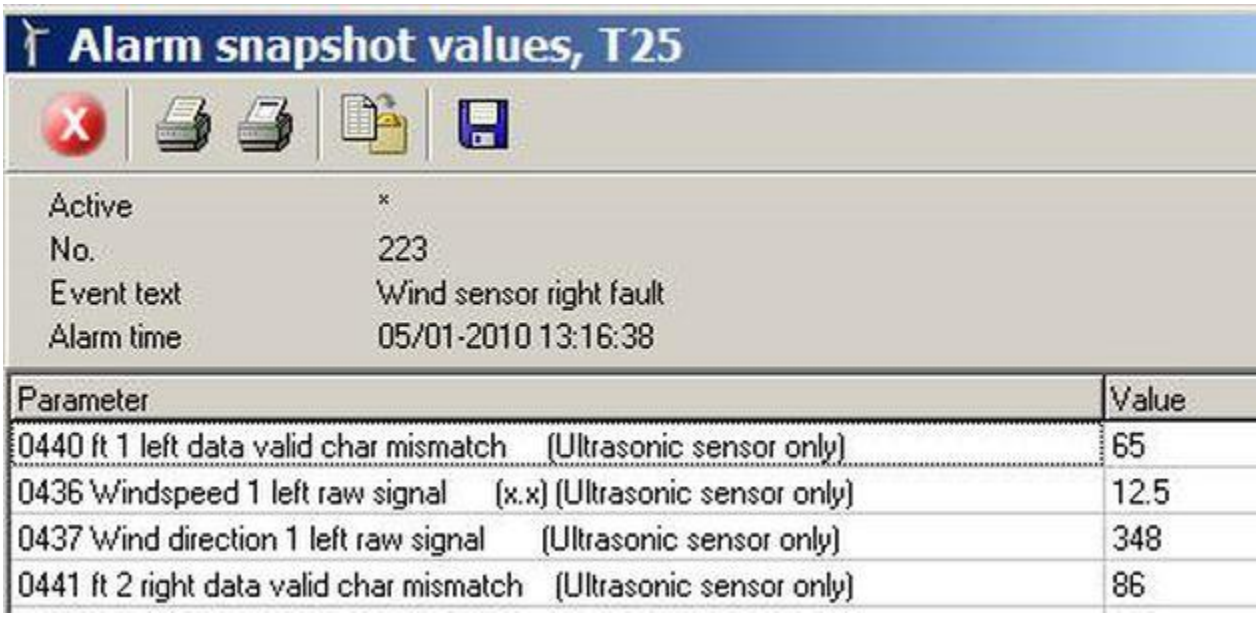
1] Yes

2] No

3] I don't know

- **Explanation**

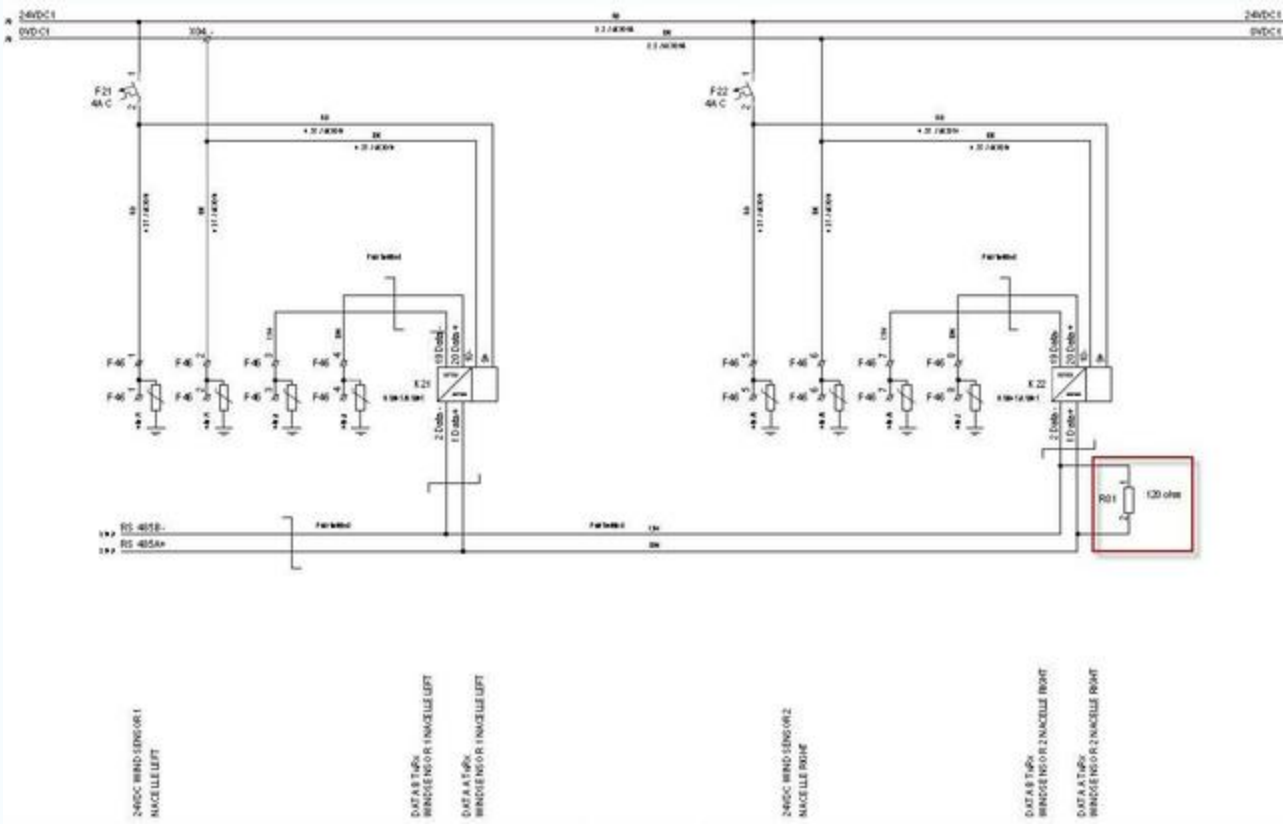
In the alarm snapshot, scroll down to see the error bit on each sensor. Parameter 0440 and 0441=> 255 = No communication (Check ICP converter) => 65 = Status OK => 86 = Status error.



Check the connections at the ICP RS485 repeaters (K21 & K22) in the AN1. Check for loose wires and plugs or corrosion at the repeater.

Check the loose connection and resistance value for R01, which connected across 21 (Data+) &22 (Data-) in K22. Replace the resistor, if it found resistance value other than 120 Ohms.

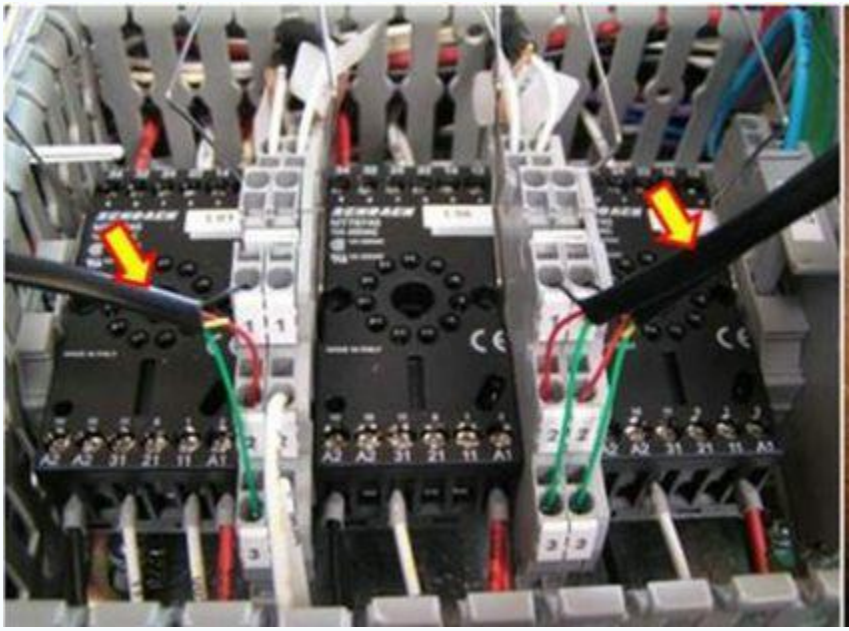

K22
ICPCON
CE
-7510

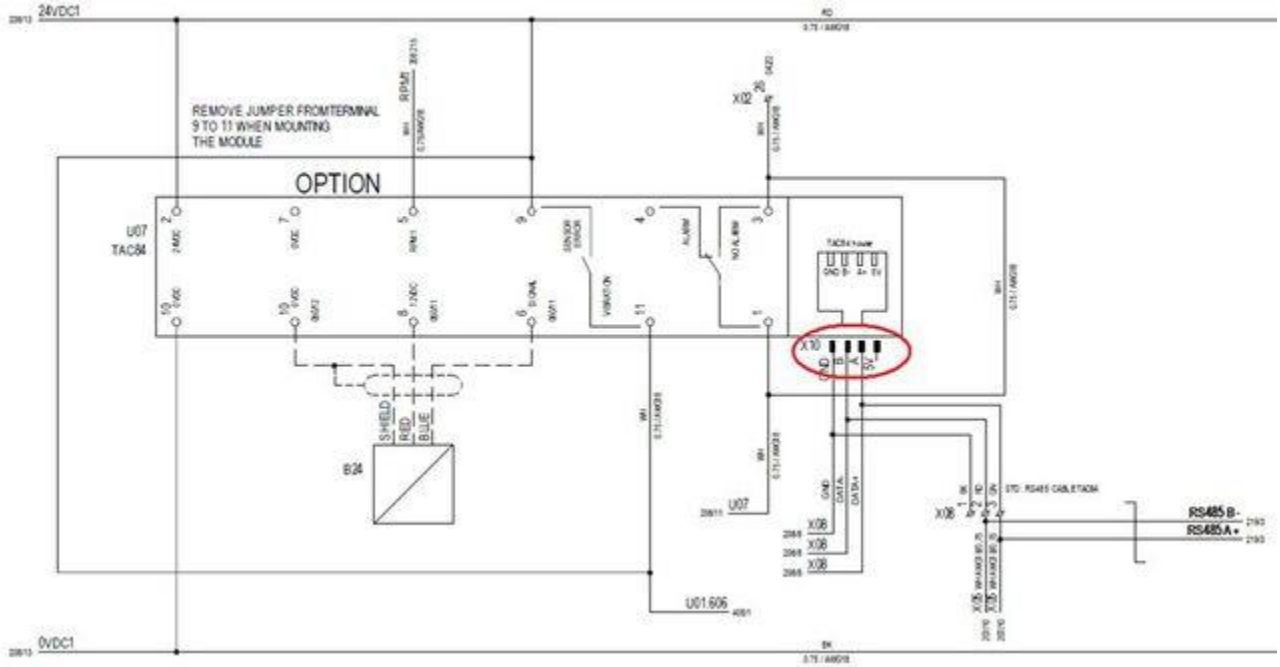


Relevant spare parts	
Description	**Item No.**
RES 121R 1% 0.6W MRS25 2.5x6.5	60000120

If there is no communication on one sensor, switch the ICP RS485 repeaters to see if the communication returns. If communication returns when the repeaters are switched, replace the faulty repeater.

Check for poor cable connection or internal short circuit on the TAC 84 / TAC 85 communication cable.





If necessary replace the cable.

Relevant spare parts	
Description	**Item No.**
RS485/RS485 REPEATER I-75	60004933
WIRING RS485 - TAC84/85	60012101

Check the continuity of B3 & B4 cores in cable W500 and replace with spare core, if no continuity.

1
2
3
4
5
6
7
8
9
X01
CONTROL PANEL +AT2
W500
TOP BOX +AN1
X01
SAFETY STOP SUPPLY
SAFETY STOP
RESET EMERGENCY LINE
GENERATOR SPEED
ROTOR SPEED
0V DC IN TOP BOX
SAFTY STOP
SAFTY STOP
SAFTY STOP
SAFTY STOP
COMMUNICATION TO HUB
COMMUNICATION TO HUB
RS485 COMMUNICATION TOP SENSOR
RS485 COMMUNICATION TOP SENSOR
EMERGENCY LINE
EMERGENCY LINE
EMERGENCY LINE
EMERGENCY LINE
OVERRIDE FROM TOP BOX
OVERRIDE FROM TOP BOX
NACELLE FAN 2OVERLOAD
NACELLE FAN 2OVERLOAD
SPARE
SPARE
SPARE
13-12-06
17:15
Vestas
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Date
Initials
Function
Designed
030906
CHO
Project title
Approved
Comments
Revised
040304
CHO
Rev.
VESTAS PROPRIETARY NOTICE

Note: The below errors also may occur due to this defective cable core;

398 - TAC-84 COMMUNICATION FAULT

399 - TAC-85 COMMUNICATION FAULT

590 - TAC-84 DOWNWIND COMMUNICATION FAULT

222 - WIND SENSOR LEFT FAULT

223 - WIND SENSOR RIGHT FAULT

Relevant spare parts	
Description	**Item No.**
Cable -W500 93m IEC	60111780