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Cod. MW6015



Combined wind speed and wind direction sensors

User's manual

Updated 07/15/2013

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1 Description

1.1 Main features

This sensor includes, in a single apparatus, the transducers for measuring wind speed and direction. Its use simplifies the installation and the plant design in respect of the systems with separate units plus giving some other advantages being smaller, lighter and cheaper.

The measurement system is made up of a sensor, the rotors DNA124 and DNA127 and the cable of DWA type. For more information about the models of the sensors see §1.2 instead for the accessories and the spare parts see §0.

The connector MG2251 is used when the user desire to realize its own cable.

1.2 Models

Power supply :	12 Vdc	12 Vdc	10-30 Vdc/Vca	10-30 Vdc/Vca
Output WS	Hz	Hz	4÷20 mA	0÷5 V
Output WD	0÷1 V	Ohm	4÷20 mA	0÷5 V
<i>Direct output wind speed/direction sensor</i>	DNA121			
<i>Direct output and low energy consumption wind speed/direction sensor</i>		DNA122		
<i>Microprocessor based wind speed-direction sensor with normalized output.</i>			DNA821	DNA827

* *Basic consumption*

**Univ.: 0 (4) ÷20 mA; 0 (1) ÷5 Vdc; 0 (60) ÷300 mV; default: 4÷20 mA.

DNA121: sensor with direct signal output: frequency (Hz) for wind speed and tension (Volt) for wind direction. These sensors are suitable to acquisition systems, like LSI LASTEM ones, recognising and managing this kind of electric signals.

DNA122: sensor with a low power consumption: it is thought for systems with small energy available.

DNA821/827: sensors with normalized output (4÷20 mA, 0÷5 Vdc), with an high accuracy of the wind speed measurement. This accuracy is assured by a microprocessor wich adjust the sensor response in each point of the wind speed measurement range.

1.3 Technical specifications

Specifications: VDI 3786 Part 2 e ASTM D 5096-96.

1.3.1 Mechanical and electrical specifications

(Calibrated by CETIAT (France))

Order numb.	DNA121#C	DNA122#C	DNA821	DNA827
WS output	0÷833 Hz		4÷20 mA	0÷5 Vdc
WD output	0-1 Vdc	0-2000 Ω	4÷20 mA	0÷5 Vdc
Power supply	12 Vdc		10÷30 Vac/dc	
Power consumption	30 mA	2 mA	0,5 W	
Wind direction principle	Hall effect sensor	2 KΩ potentiom.	Hall effect sensor	
Microprocessor	-	-	PIC 18F2620	
Data logger compatibility	M-Log (ELO007-008) R-Log (ELR515), E-Log (all models)			
Wind direction threshold	0.15 m/s	0.30 m/s	0.15 m/s	
Wind direction transfer function		$Dir_{(r)} = 355 \times R_{(Ohm)} / 2000$		

Common features		
Wind speed	Principle	N. 32 step optoelectronic disk
	Measuring range	0-60 m/s
	Uncertainty	0÷3 m/s=1.5%, >3 m/s= 1% 0.1 m/s +1% VL (readout)
	Threshold	0.26 m/s
	Resolution	Integration time = 1 s: 0,07 m/s (see §3)
	Delay distance	4,8 m (at 10 m/s). Acc to VDI3786 and ASTM 5096-96
	Response time	5 m/s: 0.90 s, 10 m/s: 0.48 s
	Delay distance at 5 m/s	5 m/s: 4.5 m, 10 m/s: 4.8 m/s
Wind direction	Principle	See table above
	Measuring range	0-360° (0-355° DNA122#C)
	Uncertainty	1% of full scale
	Threshold	0.15 m/s
	Resolution	0.3°
	Integral linearity	0.5%
	Delay distance	1.2 m (at 10 m/s). Acc to VDI3786 and ASTM 5366-96
	Response time	0.5 m/s: 0,2 s, 10 m/s: 0.12 s
	Damping coeff.	0.21: 10 m/s. Acc to VDI3786 and ASTM 5096-96
General Information	Electrical outlet terminators	7 pin IP65 watertight connector
	Housing	Anodized aluminum
	Cup	PA6 plastic and fiberglass
	Vane	Aluminum
	Mounting	Mast ø 48 ÷ 50 mm
	Mechanical protection	IP65 (vertical position)
	Electrical protections	Transzorbo on output terminators
	Operative temperature	-30°C (without ice) ÷ 70°C
	Damage threshold	>75 m/s
	Weight	950 g
	CE	Industrial environments

2 Assembly instructions

Select a well-exposed spot for the instrument. The WMO (World Meteorological Organisation) suggests that the instrument is assembled 10 m off the ground; in a place where the distance of the gauge from surrounding obstacles which might disturb the measurements, it is at least 10 times the height of those objects from the ground.

As such a position is difficult to find, the WMO suggests that the instrument is assembled in a spot which is reasonably uninfluenced by local obstructions; where the measurements taken will be as equal as possible to those taken from an ideal spot.

2.1 Mounting



Unscrew the nut and washer from the shaft thread.



Mount the DNA124 rotor on the combi sensor's body.



Tighten the screw of the rotor (indicated by the arrow).



Insert the DNA127 wind vane on the sensor's body. Keep the shank in a steady position and insert the vane until it goes to the nut adjustment.



Fix the top (indicated by the arrows) and tighten it .



Connect the cable to the sensor.



Mount the sensor on the mast and tighten the screw.



When fixing the sensor in its position on the pole, point the "red nose" to NORTH for orientation.

Read IST_00764 "Instructions for the use of DNA121-DNA122 sensors with LSI LASTEM datalogger" to connect these sensors to LSI LASTEM data loggers.

3 Connections

Connections must be performed following the drawings:

DNA827, DNA821 DISACC 5830

DNA121 DISACC 5828b

DNA122 DISACC 5692B

FUNZIONE DI TRASFERIMENTO
IN FORMA TABELLARE
TRANSFER FUNCTION TABLE

Velocita' Speed m/s	Frequenza Frequency Hz
0	0
1.001	12.31
3.011	41.12
5.02	70.51
10.026	143.17
20.08	295.04
29.99	435.28
37.71	556.82
50	734.72
60	882.19

Transfer function table for DNA121-122

4 Maintenance

Routine checks should be carried out on the combi sensor at least once a year, to ensure that:

- the rotor and flag are not in any way deformed;
- the conical pin on which the rotor rotates moves freely;
- the sensor is clean and in good condition; attention to the space between the transducer and the rotor.

It is recommended to check the sensor calibration every two years.

5 Accessories / Spare parts

Code	Description
DNA124	Rotor with cups for speed section
DNA127	Weather vane rotor for directional section
DWA510	7-wire shielded cable L = 10 m with connector
DWA525	7-wire shielded cable L = 25 m with connector
DWA526	7-wire shielded cable L = 50 m with connector
DWA527	7-wire shielded cable L = 100 m with connector
MG2251	Trailing connector
MC1040	Screws for fixing rotor and vane.
MM2011+MM2015	Set of 2+2 spare bearings
ML653	Anemometric optoelectronic speed element
ML501	Anemometric direction potentiometer

6 Conformity declarations



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DICHIARAZIONE DI CONFORMITA' CE *CE Conformity Declaration*

Produttore: LSI LASTEM s.r.l.
Applicant: Via Ex S.P. 161 Dosso, n.9 – 20090 Settala Premenugo (MI) – Italia

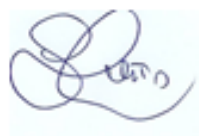
Con la presente si dichiara che i sensori di Velocità e Direzione del vento DNA121 e DNA122 per loro natura non contengono componenti elettrici/elettronici tali da generare o contribuire a generare emissioni elettromagnetiche e pertanto non sono soggetti alla Direttiva Europea:

We hereby declare that the Speed and Direction wind DNA121 and DNA122 sensors for its nature don't contain electric/electronic components to produce or to contribute to produce electromagnetic issues and therefore they aren't subject to the European Directive:

EMC Directive 2004/108/CE

La presente dichiarazione copre tutti i modelli derivanti dai prodotti sopra citati.
The present declaration covers all the options derived by the specified product.

Settala, febbraio 2012



Dr. Giulio Certo
Direttore Generale e Legale Rappresentante

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Con la presente si dichiara che tutti i prodotti delle seguenti serie:
We hereby declare that all the products of the following series:

Velocità e direzione del vento per applicazioni ambientali
Speed and Direction wind for environmental applications

- **DNA701-DNA702-DNA705-DNA706-DNA707-DNA708-DNA709-DNA710-DNA711-DNA714-DNA715-DNA716-DNA717-DNA719-DNA721-DNA722-DNA727-DNA728**
- **DNA801-DNA802-DNA805-DNA806-DNA807-DNA810-DNA811-DNA814-DNA815-DNA816-DNA821-DNA827**

a cui questa dichiarazione si riferisce, è conforme ai requisiti essenziali dei seguenti standard e documenti normativi:
to which this declaration relates, is in conformity with the relevant provisions of the following standard and other normative documents:

EN – 61326 2006 Industrial Location

che rispettano le direttive:
following the provisions of the Directive:

89/336/EEC, 2004/108/CE

La presente dichiarazione copre tutti i modelli derivanti dai prodotti sopra citati.
The present declaration covers all the options derived by the specified product.

Settala, aprile 2012



Dr. Giulio Certo
Direttore Generale e Legale Rappresentante

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