LSI LASTEM S.r.l.
Via Ex S.P. 161 Dosso, n.9 - 20090 Settala Premenugo (MI) - Italia
Tel.: (+39) 02 95 41 41
Fax: (+39) 02 95 77 05 94
e-mail: info@lsi-lastem.it
WEB: http://www.lsi-lastem.it
CF./P. Iva: (VAT) IT-04407090150
REA: 1009921 Reg.Imprese: 04407090150

Cod. MW6020

Wind direction sensors

User's manual

Updated 07/30/2013

Index

1 Description ... 3
1.1 Main features ... 3
1.2 Models and technical specifications ... 3
1.2.1 Standard sensor ... 3
1.2.2 Compact sensor ... 4
2 Assembly instructions ... 4
2.1 Mounting standard sensor ... 5
2.2 Mounting compact sensor ... 6
3 Connections ... 7
4 Maintenance ... 7
4.1 Testing ... 7
4.2 Periodic maintenance ... 8
5 Accessories / Spare parts ... 9
6 Conformity declarations ... 10

1 Description

1.1 Main features

DNA310-311#C, DNA212 uses a Hall-effect encoding system (positioning Hall effect sensor). DNA314#C is equipped with a potentiometer to reduce power consumption in very low energy applications. DNA311#C is also equipped with heaters to avoid ice formation on its body in very cold environments. In the heated versions, a thermostat controls a heater that keeps the vane moving effectively in case of freezing (power on of the heater at 4°C and power off only over 12°C).

1.2 Models and technical specifications

1.2.1 Standard sensor

Order numb.	**DNA310#C**	**DNA311#C**	**DNA314#C**
Principle	Hall effect sensor		Potentiometer
Output	0÷1 V		0-2000 Ω
Power supply	12 Vdc	24 Vdc/ac (heater), 12 Vdc (direction)	-
Heater	-	YES	-
Heater operative temperature		> -20°C	-
Power consumption	10 mA	20 W	Max 2 mA
Calibration certificate	Included		
Data logger compatibility	M-Log (ELO007-008), R-Log (ELR515), E-Log (all models)		

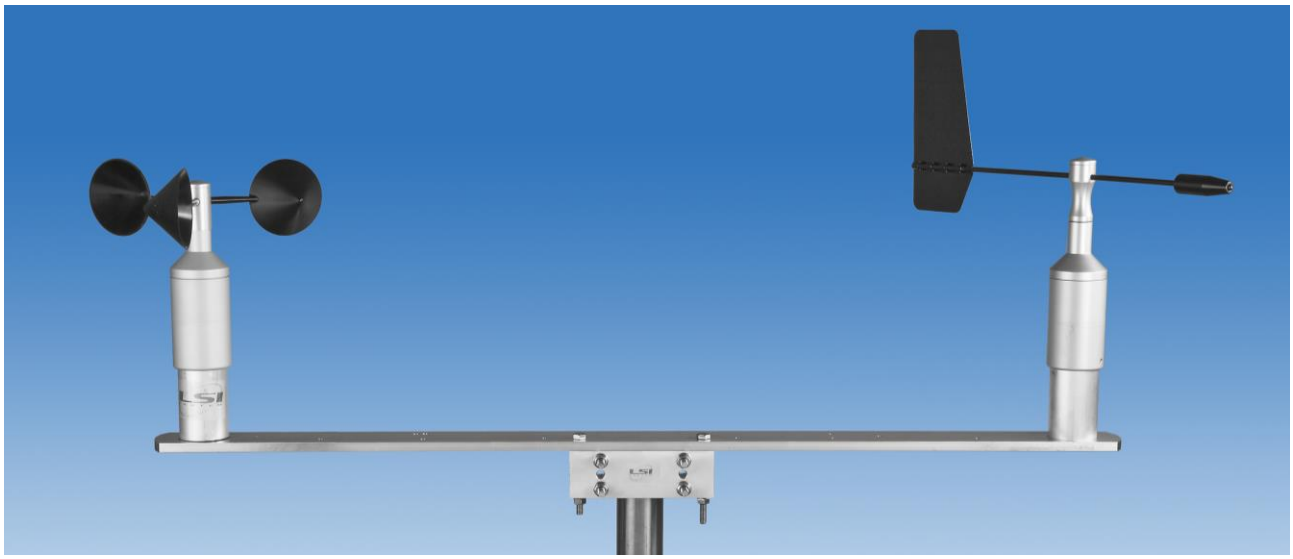
Order numb.	**DNA810**	**DNA811**	**DNA814**	**DNA815**	**DNA816**
Principle	Hall effect sensor				
Output	4÷20 mA		0÷20 mA		0÷5 Vdc
Power supply	10÷30 Vac/dc	24 Vac/dc	10÷30 Vac/Vdc	24 Vac/dc	10÷30 Vac/dc
Heater	-	YES	-	YES	-
Heater operative temperature	-	> -20°C	-	> -20°C	-
Power consumption	0,5 W	20 W	0,5 W	20 W	0,5 W

Common features		
Wind direction	Measuring range	0÷360°
	Uncertainty	3°
	Threshold	0.15 m/s
	Delay distance	1.2 m (at 10 m/s). Acc to VDI3786 and ASTM 5366-96
	Damping coeff.	0.21 (at 10 m/s). Acc to VDI3786 and ASTM 5096-96
General Information	Connector	7 pin IP65 watertight connector
	Housing	Anodized aluminum,
	Operative temperature	-35÷ +70°C (without ice)
	Mounting	Mast ø 48 ÷ 50 mm

1.2.2 Compact sensor

DNA212		
Wind direction	Principle	Hall effect sensor
	Measuring range	0÷360°
	Threshold	0.25 m/s
	Uncertainty	5°
	Delay distance	0.9 m (at 10 m/s). Acc to VDI3786 and ASTM 5366-96
	Damping coeff.	0.14 (at 10 m/s). Acc to VDI3786 and ASTM 5366-96
General Information	Output	0÷1 V
	Connector	4 pin IP65 watertight connector
	Housing	Anodized aluminum
	Power supply	10÷14 Vdc
	Power consumption	10 mA
	Mounting	Mast ø 48 ÷ 50 mm
	Operative temperature	-35÷ +70°C (without ice)
	Data logger compatibility	M-Log (ELO007-008), R-Log (ELR515), E-Log (all models)

2 Assembly instructions



The gonio-anemometer can be assembled either alone or coupled with the tacho-anemometer by mean of the coupling bar DYA046.

Select a well-exposed spot for the instrument. The WMO (World Meteorological Organization) suggests that the instrument should be assembled 10 m off the ground; in a place where the distance between the sensor and surrounding obstacles which might disturb the measurements 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 should be assembled in a spot which is reasonably uninfluenced by local obstructions.

2.1 Mounting standard sensor

Unscrew the nut and washer from the shaft thread.

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

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

Connect the cable to the sensor.

Read Part 3: Connections

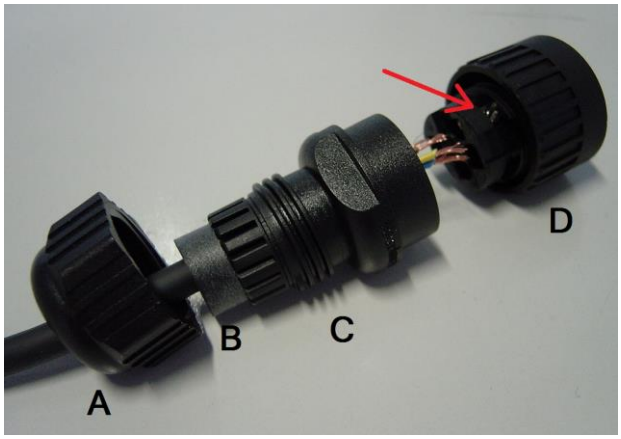
Mount the sensor on the mast and tighten the screw. When fixing the sensor in its position on the pole, point the "red nose" to NORTH for orientation.

2.2 Mounting compact sensor

Unscrew the screw from the shaft thread.

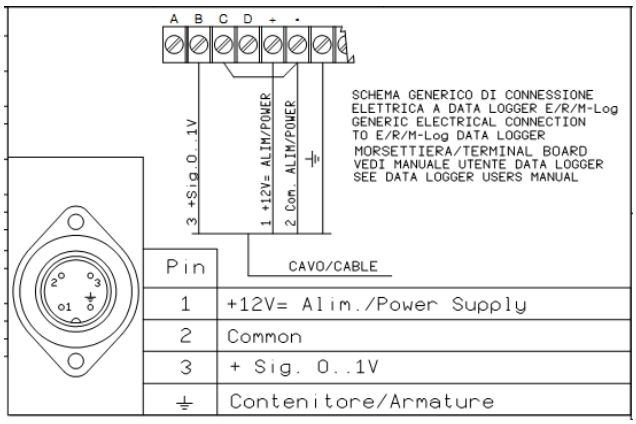
Insert the wind vane on the sensor's body. Take care to centre the wind vane's notch with the tooth on the sensor body's rotating cone.

Fix the screw and tighten it .



DNA212 comes with MG2257 free connector. Pass the cable as in the picture above, select the rubber ring B (ø 6 or 9 according to the cable dimension). Then fix the wires to the connector as in the drawing on the left. Read also DISACC 5635 drawing.

Attention to the colour of the wires when connecting the sensor to the data logger



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.

3 Connections

Connections must be performed following the drawings:

DNA212	DISACC 5635
DNA310#C, DNA311#C	DISACC 5857 + DISACC 4238
DNA314#C	DISACC 5858 + DISACC 4238
DNA81x	DISACC 5860 + DISACC 3217

4 Maintenance

4.1 Testing

This type of testing is only required if the user wishes to verify the well functioning of each part of the instrument. Please note that these tests are not intended to establish the operational limitations of the instruments.

Visual check

- body of the sensor is in a level position.
- Vane is not broken or deformed

Mechanical check

Having removed the vane, check that the conical pin (Compact version) or the shaft thread (Standard version) on which the vane rotates moves freely and perfectly smoothly. If not bearings replacement is needed.

Output operational check - DNA81x, DNA310-311#C, DNA212

Connect the system (power on the power supply) to the signal output reader and measure the wind direction with the following results:

Cardinal point	0÷1 V	4÷20 mA	0÷20 mA	0÷5 Vdc
NORTH	1 - 0	20 - 4	20 – 0	5 - 0
EAST	0.25	8	5	1.25
SOUTH	0.5	12	10	2.50
WEST	0.75	16	15	3.75

Output operational check – DNA314#C

Connect the system (power on the power supply) to the signal output reader and measure the wind direction with the following results:

Cardinal points	Resistance
NORTH	0 - 2000 Ω
EAST	500 Ω
SOUTH	1000 Ω
WEST	1500 Ω

Resistance between 0 and 2 kOhm, depending on the position of the sensor; when connecting cables 2 (black) and 3 (brown) to a multimeter.

Heater check (for heated sensor only):

- Check that the heater is in good working order;
- Remove the vane from the body of the sensor;
- Leave the sensor in a freezer for 3/4 hours at a temperature below 2 °C;
- Connect a multimeter to the ends of cables 6-Red 5-White for DNA311#C or 1-Brown 6-White for others;
- Under these conditions, the resistance recorded should be approx. 40 Ω.

4.2 Periodic maintenance

LSI LASTEM advises don't leave the sensor in outdoor operation without its rotor/vane. Routine checks should be carried out on the wind direction sensors.

- Clean the sensor, attention to the space between the transducer and the cup.

LSI LASTEM suggests to check the instrument calibration at least every 2 years.

5 Accessories / Spare parts

Code	Description
DYA046	Coupling bar For WS+WD sensors on ø 45 ÷65 mm pole
DZC404	Calibration certificate Included in DNA301-302-304#C
DNA110	Cable for DNA31x#C L.=10 m with connector
DNA125	Cable for DNA31x#C L.=25 m with connector
DNA126	Cable for DNA31x#C L.=50 m with connector
DWA510	Cable for DNA31x#C L.=10 m with connector
DWA525	Cable for DNA81x. L.=25 m with connector
DWA526	Cable for DNA81x. L.=50 m with connector
DWA527	Cable for DNA81x L.=100 m with connector
MG2251	Free connector without cable (DNA81x only)
MG2252	Free connector without cable (DNA31x#C only)
MG2257	Free connector without cable (DNA212)
DNA217	Spare part: vane (DNA80x, DNA30x#C only)
DNA218	Spare part: vane (DNA212 only)
MM2025	Spare part: bearing (DNA80x, DNA30x#C only)
MM2001	Spare part: bearing (for DNA212)
MN1071	Cable each m (for DNA212)

6 Conformity declarations

LSI LASTEM S.r.l.
Via Ex S.P. 161 Dosso, n.9 - 20090 Settala Premenugo (MI) - Italia
Tel.: (+39) 02 95 41 41 **WEB:** http://www.lsi-lastem.it
Fax: (+39) 02 95 77 05 94 **CF./P. Iva:** (VAT) IT-04407090150
e-mail: info@lsi-lastem.it **REA:** 1009921 **Reg.Imprese:** 04407090150

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 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

CE_00166_it-en_1