LAMBRECHT
METEOROLOGICAL INSTRUMENTS GERMANY

Combined Small Wind Sensors
(1453 S2)

- **Small, light, robust**
- **Especially designed for applications on ships and buoys**
- **Special surface treatment**
- **Most seawater resistant**

The Model (1453 S2) is a combined sensor for wind direction and wind speed. The housing, the wedge-shaped wind vane and the cup rotor are made of seawater resistant aluminium surface.

The sensor is designed for universal applications where heating is not required. The housing is very small and light and can be mounted easily.

For an easy connection the sensor has at the bottom a 7-pole male connector. The 7-pole female connector belongs to the delivery.

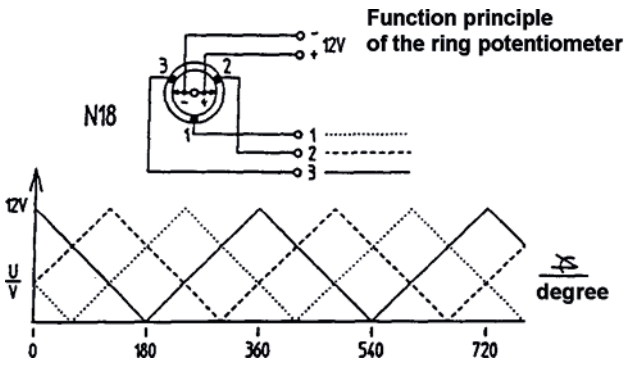
Function

The wind vane axle and the rotor cup axle are coaxial arranged and running in independently of each other on ball bearings.

The three-armed cup rotor will rotate from the wind. The number of revolutions of the cup rotor is proportional to the wind speed. A DC precision generator (type G2) attached to the cup rotor converts them into a linear output current.

The wind direction is determined with a wedge shaped wind vane.

Model (1453 S2 N): The wind vane is connected to a triple-tapped precision ring potentiometer. The potentiometer is designed as an endless wound resistor with three tappings each of which is 120 degrees away from the others. Two sliders placed opposite each other, i.e. in an angle of 180 degrees and connected to the wind vane feed a 10...12 V_{DC} voltage into the potentiometer. The three output voltages at the tappings and depending on the angle of the vane are shown below.



Model (1453 S2 F1000): The wind vane is connected to a linear resistance transmitter. The voltage output dependent of the wind direction is designed as four-wire system.

Installation

Choice of the installation place

For representative wind measuring the sensor should be installed at a place free of large obstacles. The distance between obstacle and sensor should be at least 10 times the height of the obstacle. Furthermore the sensor should at least 5 meter higher than the height of the obstacle.

Assembly

The mounting flange arranged at the base of the sensor housing is put on the wind mast. Attention should be paid that the mounting flange of the sensor will not come in contact with brass or galvanized iron fittings, otherwise damages by electrolytical corrosion are to be expected. If necessary, an insulating intermediate layer should be provided for.

Before fixing, the sensor is adjusted to north.

Adjusting to north

The alignment of the sensor is made by using the mounting flange as line of sight. With the aid of a compass and taking into consideration the local declination there is determined a striking reference point lying in the north. The sensor is then turned until the chosen striking reference point is in alignment with the mounting flange used as line of sight and the eye of the observer (please, consider the direction of arrow).

At least the connector has to be connected to the sensor.

Electrical Wiring

The 7-core connecting cable has electrically to be connected with the sensor by closing the plug connection. The cable should be led inside or outside the mast in suitable manner downward to the junction box. Beneath the sensor, care must be taken for a sufficient traction relief of the cable.

We recommend a shielded 8 x AWG 20 C UL sw cable with a conductor cross section of about 0,56 mm². Cables with plug connectors are available from LAMBRECHT. The wiring must be done described in the wiring diagram.

Application Notes

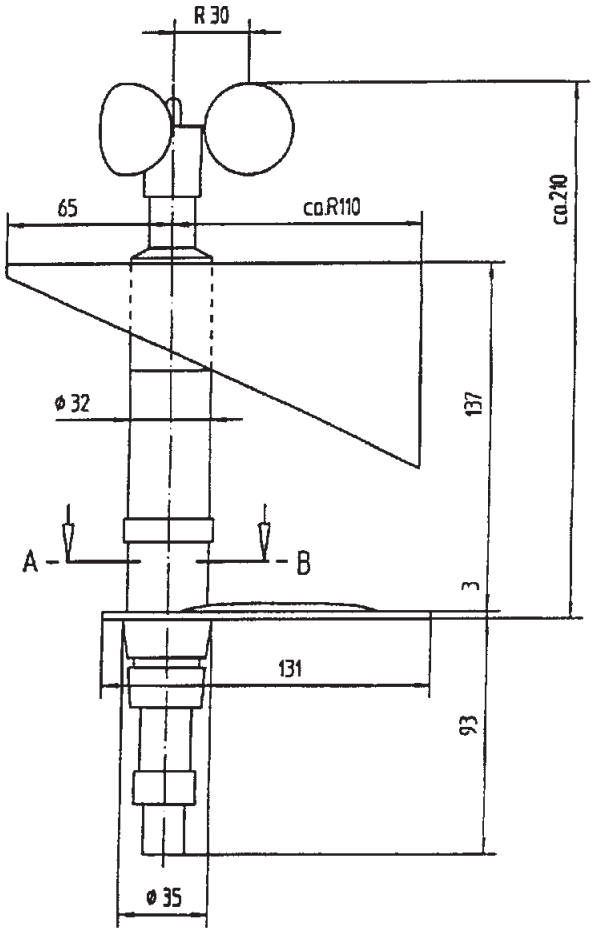
Maintenance

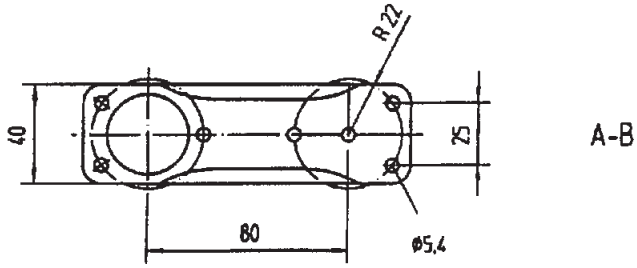
The sensor is designed for long life. The bearing must not be lubricated. If you notice a significant increase of the starting value of the sensor, you should send the sensor for repairing. Please use a suitable packing case.

Low Temperature Performance

The sensor (1453 S2) is treated with a high-grade oil. Its viscosity is defined for a temperature range down to -35 °C. Under favourable climatological circumstances (no sleet, hoarfrost or sensor icing), the sensor withstands these temperatures.

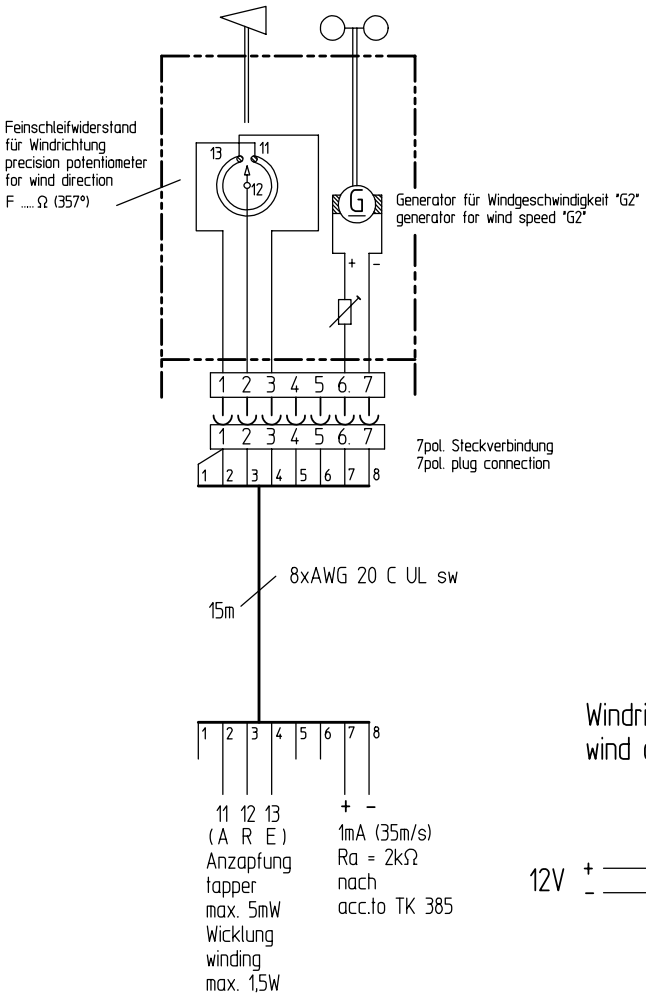
Dimensional Drawing





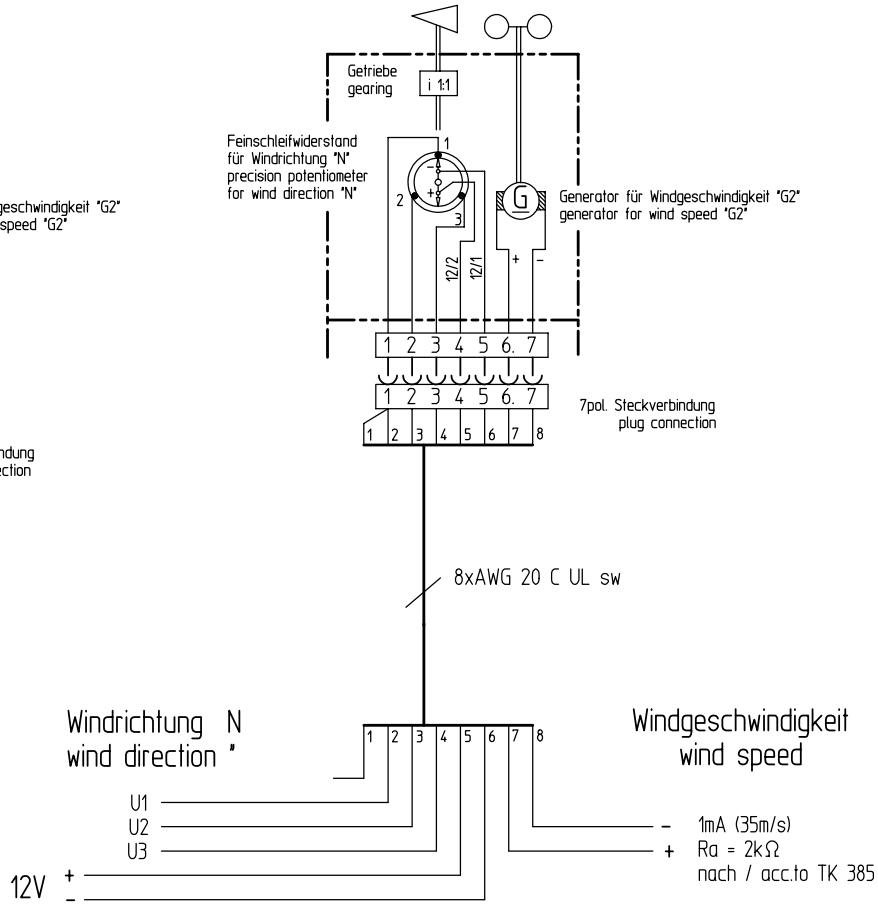
Wiring Diagram

1453 S2 F1000



Wiring Diagram

1453 S2 N



AWG Colour Code Table

	AWG C UL			
Ader core	AWG-Farbcode		colour code	
1	schwarz	sw	black	blk
2	braun	br	brown	brn
3	rot	rt	red	red
4	orange	or	orange	ora
5	gelb	ge	yellow	yel
6	grün	gn	green	grn
7	blau	bl	blue	blu
8	violett	vi	violet	vio
9	grau	gr	gray	gry
10	weiß	ws	white	wht

Varieties/ spare parts	Specification	Id-No.
(1453 S2N) Sensor for Wind Direction and Wind Speed	3-armed cup rotor with DC generator D2 as measuring element; wedge-shaped vane with triple-tapped precision ring potentiometer	00 .14532. 000 300
(1453 S2F1000) Sensor for Wind Direction and Wind Speed	same as (1453 S2N), but wegde-shaped vane with linear resistance transmitter; Resistance value: 0...1000 ohm = 0...358°, northwards 2° wattless winded	00 .14532. 000 030
(1476 Q144N) Analog Indicator for Wind Direction	with three-coil system; scale with markings for the 8 main and the 8 intermediate wind directions; 144 x 144 x 130 mm (W x H x D)	00 .14763. 000 000
(1477 Q144) Analog Indicator for Wind Speed	with moving-coil system; for switchboard mounting; measuring range: 0...35 m/s, division 1 m/s; input signal: 0...1mA , Ri = 2000 Ohm) 144 x 144 x 90 mm (W x H x D)	00 .14773. 035 210
Seperate Connecotor	7 pole	32 .14530. 061 000

Technical data

Professional Line	Series (1453 S2)	Combined Small Wind Sensors	
		Wind direction	**Wind speed**
Measuring element:		wedge-shaped wind vane	3-armed cup rotor
Measuring range:		0...360°	0...35 m/s
Accuracy:		± 1%	± 2% FS
Resolution:		0.1°	0.1 m/s
Starting value:		1 m/s related to a deflection of the wind vane of 90°	1 m/s
Range of application:		temperatures -30...+70°C no icing · wind speed 0...60 m/s	
Output:		1 mA at 0...35 m/s · R_a = 2000 Ω	
Supply voltage:		12 V_{DC}/ max. 0.6 W for direction transmission	
Housing:		seawater resistant aluminium · special surface · IP 53 · black	
Dimensions/ Weight:		cup rotor Ø 96 mm · H 290 mm · for mounting strap · 0.3 kg (1.8 kg with cable)	
Included in delivery:		1 plug · 7-pole · when a cable is ordered, the plug is mounted to that	
Accessories:		**Indicator units** e. g. (1476 Q144N) · (1477 Q144)	
32.14530.060 010	(1453 U60a)	**Cable** · 10 m · with 7-pole plug · ready-made	
32.14530.060 060	(1453 U60f)	**Cable** · 15 m · with 7-pole plug · ready-made	
32.14530.060 090	(1453 U60i)	**Cable** · 2 m · with 7-pole plug · ready-made	

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