

Anemometer Young Propeller 27106T

Order-No: P 6161

- Low threshold precision air velocity sensor
- Fast response helicoid propeller
- High quality tech-generator transducer
- Suitable for wide range of signal translators and data logging devices
- Measurement of air flow from any direction
- Vertical air measurements
- CFT Propeller



Description

The Young Propeller Anemometer is a low threshold precision air velocity sensor employing a fast response helicoid propeller. The instrument uses a high quality tech-generator transducer which converts propeller rotation to a DC voltage that is linearly proportional to air velocity. The output signal is suitable for a wide range of signal translators and data logging devices. Airflow from any direction may be measured, however, the propeller responds only to the component of the air flow which is parallel to the axis of its rotation. Off-axis response closely approximates a cosine curve (see accompanying graphs) with appropriate polarity. With perpendicular air flow, the propeller does not rotate. For detailed studies of low air speeds, optional propeller shaft extensions improve response in the 90° stall region by improving symmetry and reducing the stall angle. The instrument mounts to 3/4 inch standard pipe. A rugged cable connector provides both electrical and mechanical connection. A dustcap is provided to protect the connector when the instrument is removed.

Initial Checkout

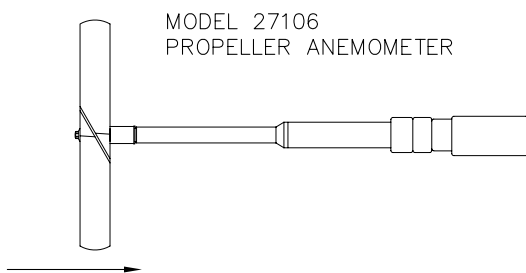
When the instrument is unpacked it should be carefully checked for any signs of shipping damage. The propeller shaft should rotate easily without friction. Using the WIRING DIAGRAM as a guide, connect the instrument to an indicator or voltmeter and check for proper signals from the sensor. The calibration may be checked using the methods outlined in the CALIBRATION section of this manual.

Generally, the instrument should be oriented with the propeller facing the predominant flow of air being measured. In some cases it is appropriate to orient the instrument so the predominant air flow is perpendicular to the propeller such as in applications measuring the vertical component of wind. Keep in mind that off-axis response increases the effective threshold and distance constant. For vertical measurements mount the instrument so the propeller faces upward. This helps prevent moisture or dirt from entering around the propeller hub and potentially contaminating the bearings. If the instrument is used to measure high air velocity or left for extended periods without attention, tape the threaded cable connector collar to eliminate the possibility of loosening from vibration. The threaded joint between the generator and shaft housings may also be taped. For some applications commutator ripple from the techgenerator may need to be reduced. Use a 500 uF 10 VDC nonpolarized capacitor connected across the sensor leads as shown in the wiring diagram. Given the low internal resistance of the tech-generator the effective time constant of this filter is approximately 15 mS and will not degrade measurement accuracy to any significant degree. The instrument measures both forward and reverse air flow. Signal polarity relative to the connection pins is shown in the wiring diagram. In applications measuring horizontal air flow, most users connect the sensor to produce a positive signal with flow from the front (counterclockwise propeller rotation). In applications measuring vertical air flow, the sensor is usually connected so downdrafts produce a negative signal, updrafts a positive signal. Output from the tech-generator should be connected to a load impedance of 10k ohms or higher.

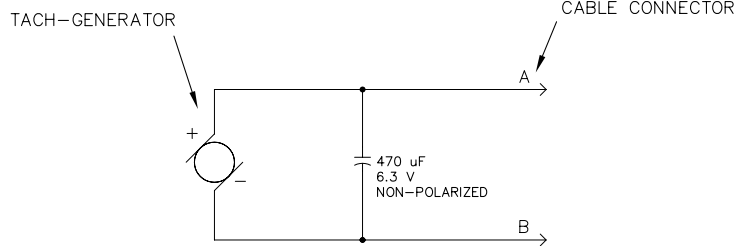
Specification Anemometer Young Propeller 27106T: P 6161

Measurement Range	0 - 40 m/s (90mph - axial flow)
Measurement Range	0 - 35 m/s (80mph - all angles)
Propeller	20 cm diameter 4 blade helicoid propeller molded of carbon fibre thermoplastic
Pitch	30.0 cm air passage per revolution
Operating Temperature	-50...+50°C (-58 to 122° F)
Distance Constant	2.1 m (6.9 ft) = values for axial flow
Threshold Sensitivity	0.4 m/s (0.8 mph) = values for axial flow
Signal Output	analog DC voltage proportional to axial wind component. Polarity reverses with reverse rotation. 1800rpm (500mV) = 9.0 m/s (20.1 mph)
Power Requirement	self powered
Manufacturer	Young

Specification represents nominal values determined in accordance with ASTM standard procedures.



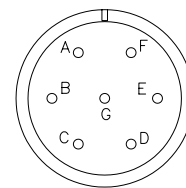
MODEL 27106
PROPELLER ANEMOMETER



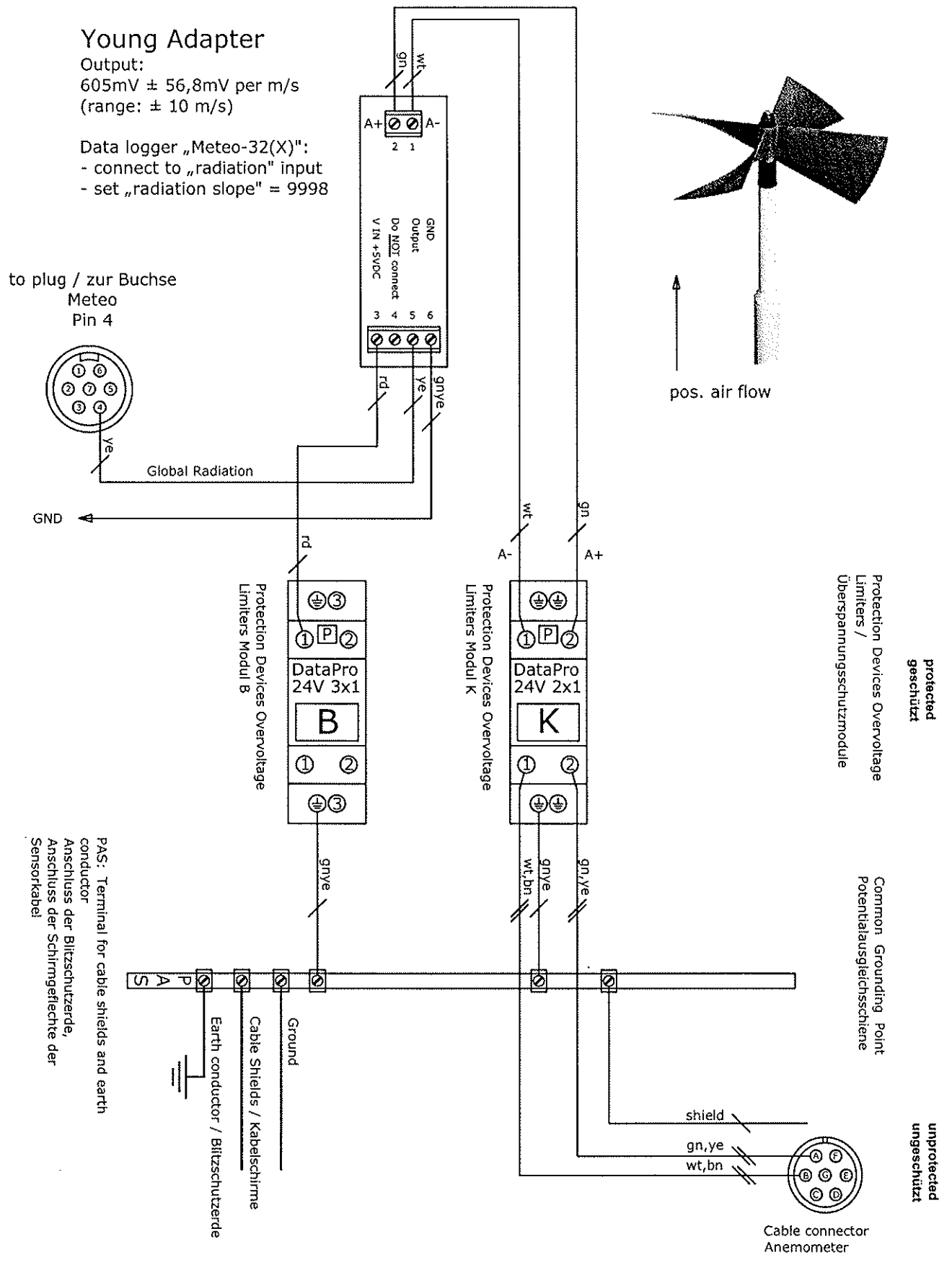
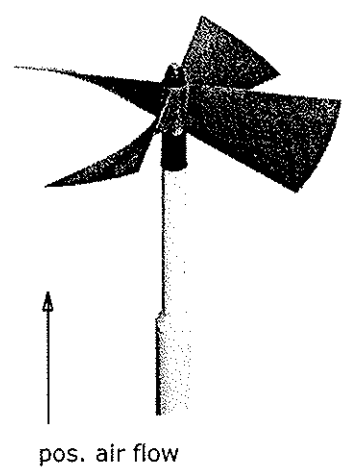
TACH-GENERATOR POLARITY SHOWN FOR WIND FLOW ONTO FACE OF PROPELLER AS INDICATED IN DRAWING ABOVE. POLARITY REVERSES WITH WIND FLOW FROM OPPOSITE DIRECTION.

GENERATOR OUTPUT:
500 mV AT 1800 rpm
417 mV AT 1500 rpm

ARMATURE RESISTANCE:
32 OHMS



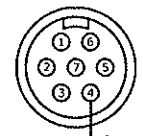
CABLE CONNECTOR



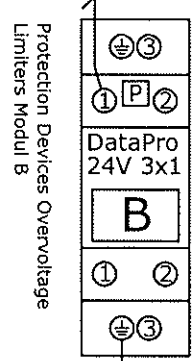
Young Adapter
 Output:
 605mV ± 56,8mV per m/s
 (range: ± 10 m/s)

Data logger „Meteo-32(X)“:
 - connect to „radiation“ input
 - set „radiation slope“ = 9998

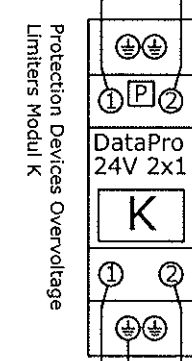
to plug / zur Buchse
 Meteo
 Pin 4



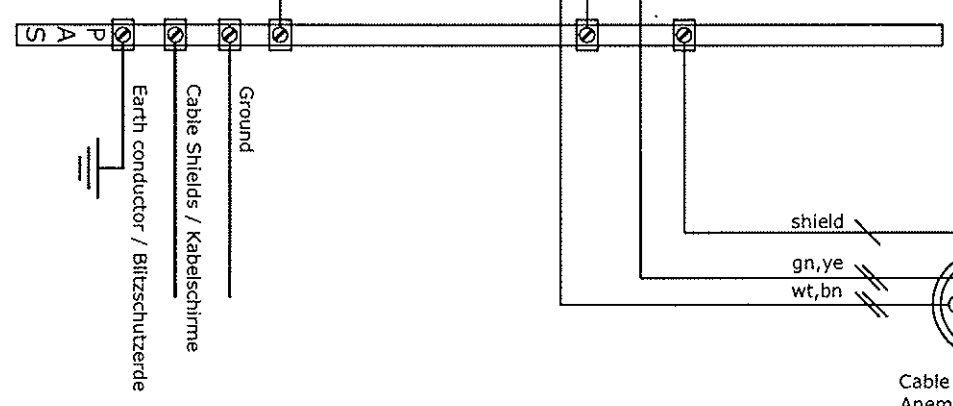
Global Radiation
 GND



Protection Devices Overvoltage
 Limiters Modul B



Protection Devices Overvoltage
 Limiters Modul K



PAS: Terminal for cable shields and earth conductor
 Anschluss der Blitzschutzterde,
 Anschluss der Schirmgeflechte der
 Sensorkabel

Legend / Legende
 wt = white/weiß
 bn = brown/braun
 gn = green/grün

ye = yellow/gelb
 gr = grey/grau
 pi = pink/rosa
 bl = blue/blau
 rd = red/rot
 bk = black/schwarz

vio = violet/Violett
 grpi = grey-pink/grau-rosa
 gnye = green-yellow/grün-gelb

Datum: 23.02.2009
 erstellt von/am: ASM
 geprüft von: JS
 Gespeichert unter:
 P6161.002M_P8041M Adapter for Young Propeller ÜS
 2009_02.dwg

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Adapter for Young Propeller ÜS
 P6161.002M / P8041M

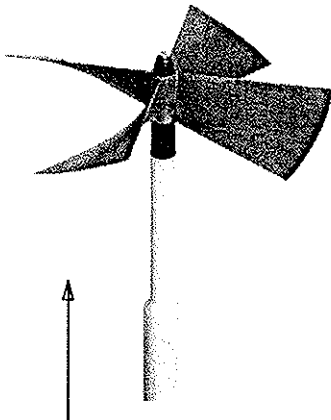
Blatt
 2/2

to plug / zur Buchse
Meteo
Pin 4

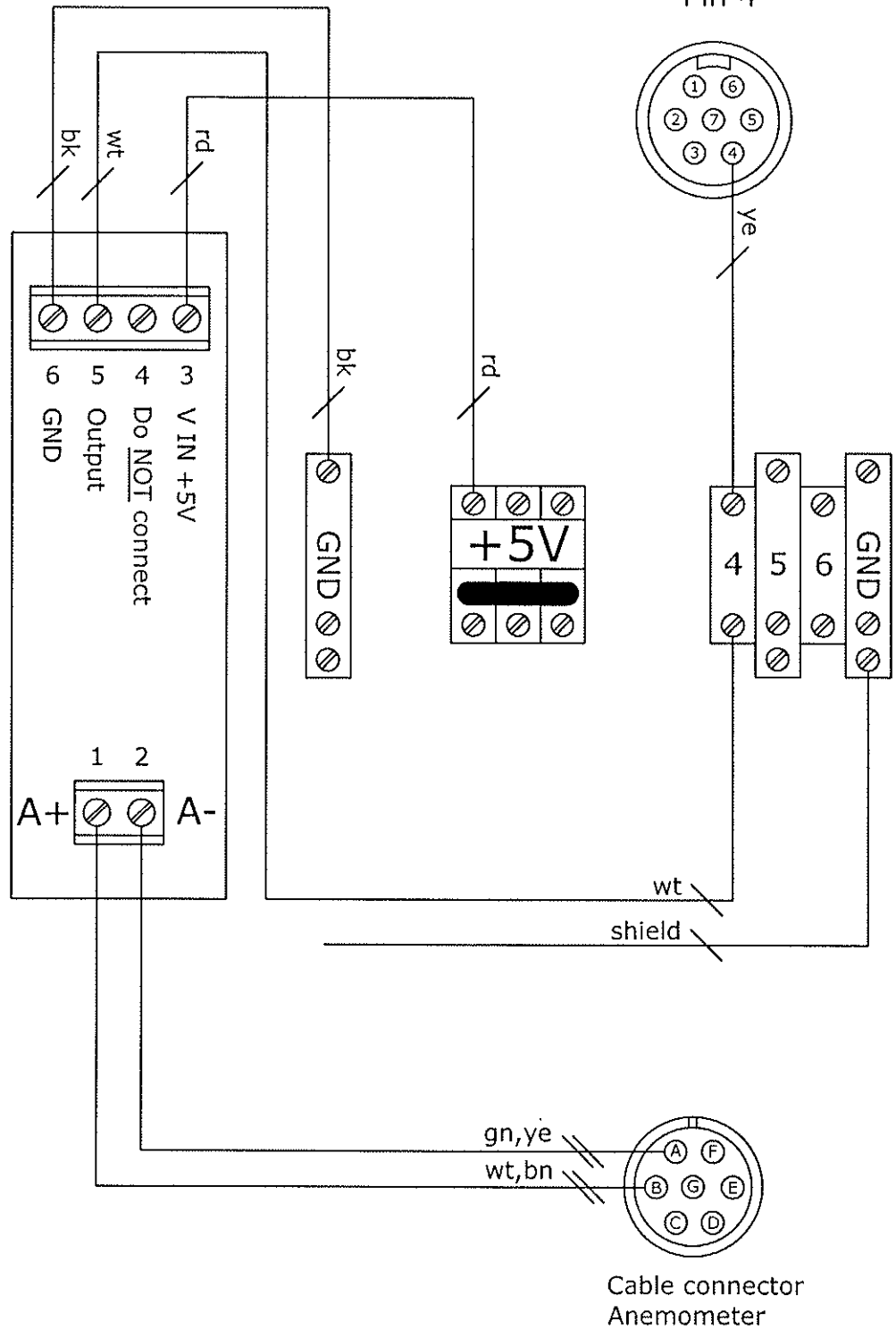
Young Adapter

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pos. air flow



Legend / Legende

wt = white/weiß	ye = yellow/gelb	bl = blue/blau	vio = violet/violett
bn = brown/braun	gr = grey/grau	rd = red/rot	grpi = grey-pink/grau-rosa
gn = green/grün	pi = pink/rosa	bk = black/schwarz	gnye = green-yellow/grün-gelb

Datum: 04.11.2008

erstellt von/am: ASM

geprüft von: JS

Gespeichert unter:

P6161.002 Adapter for Young Propeller_2008_11.dwg

Ammonit

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Adapter for Young Propeller

Blatt

P6161.002

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