

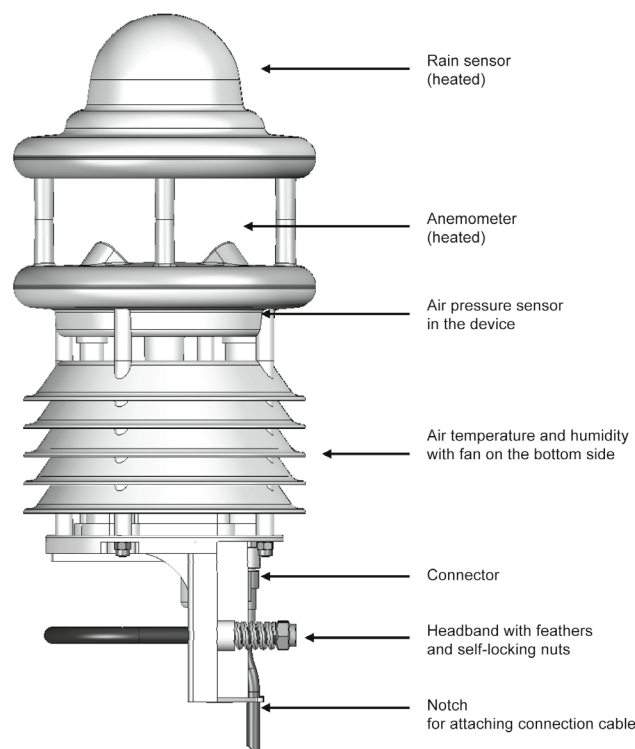


Compact Glossary of Meteorological Terms

Response value	The wind velocity at which the cup or the wind vane starts to move.
Barometer	General term for the device measuring the atmospheric pressure.
Barometric pressure	Pascal [Pa] = Newton per square meter [N/m²]; 1hPa=1mbar; 1 bar=10 ⁵ Pa
Beaufort	Classification for certain wind velocity ranges: bft m/s bft m/s bft m/s bft m/s bft m/s bft m/s 0 0 - 0.2 1 0.3- 1.5 2 1.6- 3.3 3 3.4- 5.4 4 5.5- 7.9 5 8.0-10.7 6 10.8-13.8 7 13.9-17.1 8 17.2-20.7 9 20.8-24.4 10 24.5-28.4 11 28.5-32.6 12 32.7-36.9 13 37.0-41.4 14 41.5-46.1 15 46.2-50.9 16 51.0-56.0 17 56.1-61.2
Damping ratio	Measure for the damping of wind vanes. It is the ratio of successive damped deflection amplitudes (e.g. 3rd to 1st amplitude) in one direction.
Distance constant	Is the distance that has been passed by the wind and which is reached when, after a sudden change of the wind velocity, the velocity has reached 63% of the final value.
Gray code	One step digital code used for the wind direction.
Altitude formula	Mathematical reduction of the barometric air pressure to a reference altitude, at minimum to sea level (QFF). Example: with each altitude increase of 8m the pressure decreases by approximately 1hPa.
Detection limit	The lowest value of the wind velocity and wind direction where a stable measured value is established.
Normal pressure	The barometric normal pressure (1013.25hPa) that, according to DIN ISO 2533, serves as base value for the 'high pressure' and 'low pressure' data.
QFE	The atmospheric pressure that has been reduced to the elevation of an airport runway.
QFF	Designation used in aviation for the barometric air pressure that has been reduced to sea level (0m). Also serves as a common base for the barometric air pressure comparison of different weather stations with different elevations of the stations and it is the base for the presentation of the isobars in weather maps.
QNH	Designation commonly used in aviation for the barometric air pressure, which has to be entered into an altimeter as an initial value so the altimeter can indicate the altitude above sea level.
Altitude of station	The local elevation regarding the installation of the measuring station incl. the barometer above sea level.
Variation	The range in which the wind direction has been changing within the preceding 10 minutes (acc. to ICAO).
Wind velocity	Usual practical units: 1m/s = 3.6km/h = 1.9455knots
Wind direction	Specification of which direction the wind comes from. The specification is based on a clockwise setup starting from North to East (90°), South (180°) and West (270°) to North (360°).
Wind travel	Is the distance travelled by the wind during a certain period.

Compact meteorological transducer for professional use - FMD760

Digital sensors for measuring wind, precipitation, air temperature, atmospheric humidity, atmospheric pressure. Maintenance-free measuring procedures for wind and precipitation
Forced-ventilated radiation-protected housing



Technical data and functions

Digital meteorological transducer for operating with ALMEMO® V7 devices

This digital meteorological transducer, with its integrated signal processor or A/D converter, can acquire all important weather variables in one device (over 20 different measurable variables). Up to 10 measuring channels can be evaluated simultaneously via the ALMEMO® D7 plug.

On leaving our factory the following variables are programmed : wind velocity (m/s), wind direction (°), precipitation quantity (mm), precipitation intensity (mm/h), air temperature (°C), relative atmospheric humidity (% RH), barometric atmospheric pressure (hPa).

The meteorological transducer operates with current ALMEMO® V7 devices, including precision measuring instrument ALMEMO® 710 and professional measuring instrument ALMEMO® 202.

For professional applications

The meteorological transducer complies in essence with all specifications laid down by the WMO (world meteorological organization) and is used in a wide variety of areas, e.g. weather services, water management, transport technology (roads, rail), agriculture, renewable energy technology, and the monitoring of air quality and atmospheric emissions.

The transducer can be fitted quickly and easily, e.g. on a mast or pole, using the supplied bracket.

The connection cable can be plugged onto the transducer. In the small connection box the signal cables are clamped and the mains unit 24V for the heating system supply are plugged. In mobile use (without mains unit 24V) heating and fan (see below) are deactivated, and the rainfall radar (see below) can be operated in Energy Saver mode. 1

Wind

Wind is measured by means of four ultrasonic sensors (the four main compass points). From the runtime differences the wind velocity is calculated in m/s and the wind direction in °.

This measuring procedure is maintenance-free (no moving parts). For operation in winter the ultrasonic sensors can if so required be heated.

Precipitation, rainfall

Precipitation is acquired using tried and tested radar technology. A Doppler radar measures the velocity of individual drops of rain / snow. Precipitation quantity (in mm) and precipitation intensity (in mm/h) can be calculated on the basis of the correlation of drop size and drop velocity. The type of precipitation (rain / snow) is determined on the basis of the different velocity of descent.

This measuring procedure is maintenance-free (no moving parts). For operation in winter the precipitation sensor can if so required be heated.

Air temperature and atmospheric humidity

Air temperature is measured (in °C) by means of a high-precision NTC resistance sensor; relative atmospheric humidity is measured (in % RH) by means of a capacitive humidity sensor. These sensors are enclosed in a forced-ventilated radiation-protected housing in order to minimize external influences (e.g. solar radiation, etc.). This ensures that in spite of high solar radiation accurate measuring results can still be achieved. The forced ventilation, similarly, improves responsiveness in the event of condensation.

Atmospheric pressure

Absolute atmospheric pressure is measured (in hPa) by means of an integrated sensor.

Measured values

The sensors in the meteorological transducer measure the current measured values continuously and at their internal sampling rate. In the ALMEMO® D7 plug the minimum / maximum / average values and quantities are calculated (at the output cycle of the ALMEMO® V7 device); this is for the purpose of various measurable variables.

Technical data

Wind velocity		Measuring range	300 to 1200 hPa
Measuring method	Ultrasonic	Resolution	0.1 hPa
Measuring range	0 to 75 m/s	Accuracy sensor	±0.5 hPa (0 to +40 °C)
Resolution	0.1 m/s	Sampling rate	1 minute
Accuracy	±0.3 m/s or ±3 % (0 to 35 m/s) ±5 % (>35 m/s) RMS	ALMEMO® D7 quantities	Current momentary value
Response threshold	0.3 m/s	Operating conditions	
Sampling rate	10 seconds	Temperature	-50 to +60 °C (with heating)
ALMEMO® D7 quantities	Average value, minimum value, maximum value (at output cycle)	Relative humidity	0 to 100 % RH
Wind direction		Dimensions (including fixture)	
Measuring method	Ultrasonic	Height	343 mm
Measuring range	0 to 359.9 °	Diameter	150 mm
Resolution	0.1 degrees	Weight	approx. 1.5 kg (including fixture, excluding connection cables)
Accuracy	<3 ° (>1 m/s)	Housing	
Response threshold	0.3 m/s	Plastic Protective class IP66	
Sampling rate	10 seconds	Fixture	Mast fixture, stainless steel, for Ø 60 to 76 mm
ALMEMO® D7 quantities	Average value, minimum value, maximum value, average value as text (at output cycle)	Sensor connector	Built-in plug
Precipitation, rainfall		Sensor connection cable	fitted in connection box Length (see variants, accessories)
Measuring method	Radar sensor	Connection box	
Measuring range	Drop size 0.3 to 5.0 mm	Clamp fitting the sensor connection cable and the ALMEMO® connection cable	
Resolution	Precipitation, liquid 0.01 mm	Plug fitting the mains unit cable for the heating system supply	
Precipitation types	rain, snow	Dimensions 80 x 82 x 55 mm	
Reproducibility	typical >90 %	3 cable glands	
Response threshold	0.002 mm	Heating	
Sampling rate	On reaching the response threshold, event-dependent	Supply voltage	24 VDC
Rainfall intensity	0 to 200 mm/h; Sampling rate 1 minute	Current consumption	1.7 A (40 W) via external mains unit ZB1024NA2 (in delivery), 100 to 240 V AC / 24 V DC, 4,17 A with hollow connector, fitted in the connection box
ALMEMO® D7 quantities	Rainfall quantity or snow quantity (at the output cycle) Rainfall intensity or snow intensity, current momentary value	ALMEMO® connection cable	fitted in connection box Length = 2 meters
Air temperature		ALMEMO® D7 plug	
Measuring method	NTC	Refresh rate 2 seconds for all current momentary values	
Measuring range	-50 to +60 °C	Average value, maximum value, minimum value and quantities - at the output cycle (minimum 2 sec. up to 24 hours) of the ALMEMO® V7 device	
Resolution	0.1 K (-20 to +50 °C), otherwise 0.2 K	Supply with mains unit 24V (default):	
Accuracy sensor	±0.2 K (-20 to +50 °C), otherwise ±0.5 K (>-30 °C)	All functions available.	
Sampling rate	1 minute	24 V from the mains unit, max. 1,8 A.	
ALMEMO® D7 quantities	Current momentary value, average value, minimum value, maximum value (at output cycle)	12 V from ALMEMO® device, typ. 10 mA.	
Atmospheric humidity		Supply without mains unit 24V (mobile operation):	
Measuring method	capacitive	Fan and heating deactivated.	
Measuring range	0 to 100 % RH	12 V from ALMEMO® device,	
Resolution	0.1 % RH	typ. 130 mA with rainfall radar in continuous operation.	
Accuracy sensor	±2 % RH	Operating in Energy Saver mode 1:	
Sampling rate	1 minute	typ. 25 mA, no rain test / no rain,	
ALMEMO® D7 quantities	Current momentary value	typ. 130 mA for 2 s / Min in the rain test,	
Atmospheric pressure		typ. 130 mA continuously, in the rain	
Measuring method	MEMS sensor, capacitive		

Accessories

Sensor connection cable, free ends	Length = 20 meters
Sensor connection cable, free ends	Length = 50 meters
Overvoltage arrester (for stationary operation)	

Order no.

ZB9760AK20
ZB9760AK50
ZB9760USP

Variants

Digital meteorological transducer for measuring wind, precipitation, air temperature, atmospheric humidity, atmospheric pressure. Forced-ventilated radiation-protected housing, integrated heating, bracket for mast fitting. Sensor with built-in plug, including sensor connection cable Length = 10 meters fitted in connection box, external mains unit ZB1024NA2, fitted in the connection box, ALMEMO® connection cable fitted in connection box Length = 2 meters with ALMEMO® D7 plug

Order no.

FMD760

DAkKS / DKD or factory calibration for digital sensors, see chapter "Calibration certificates".
The DAkKS / DKD calibration meets the requirements of DIN EN ISO/IEC 17025 for test equipment.

Other versions:

Digital meteorological transmitter FMD7 70**Compact transmitter for professional use**

Digital sensors for global radiation and further measured variables such as wind, precipitation, air temperature, humidity, atmospheric pressure.

**Technology and function****Global radiation**

The global radiation is measured with the pyranometer mounted in the cap of the transmitter.

For further measured quantities and general functions see FMD7 60.

Technical data**Global radiation**

Measuring method	thermopile pyranometer
Spectral range	300 ... 1100 nm
Measuring range	0 ... 2000 W/m ²
Resolution	< 1 W/m ²
Measuring rate	10 seconds
ALMEMO® D7 range:	Actual value

For technical data on the other measured variables and general functions, see FMD7 60

Features

Digital meteorological sensor for wind, precipitation, air temperature, humidity, atmospheric pressure and global radiation. Ventilated radiation protection, built-in heater, mounting bracket for mast mounting. Sensor with built-in plug, including sensor connection cable, length = 10 m, mounted in the connection box. Power supply unit 24 V ZB1024NA2, mounted in the connection box, ALMEMO® connection cable, mounted in the connection box, length = 2 m with ALMEMO® D7 connector

Order no.**FMD770****Digital meteorological transmitter FMD7 20****Compact transmitter for professional use**

Digital sensors for wind. Maintenance-free measuring method.

**Technology and function****Wind**

Technology for wind measurement and general functions see FMD7 60

Technical data

For technical data on wind and general functions see FMD7 60

Features

Digital meteorological transmitter for wind. Built-in heater, mounting bracket for mast mounting. Sensor with built-in plug, including sensor connection cable, length = 10 m, mounted in the connection box. Power supply unit 24 V ZB1024NA2, mounted in the connection box, ALMEMO® connection cable, mounted in the connection box, length = 2 m with ALMEMO® D7 connector

Order no.**FMD720**



Weather-proof housing for ALMEMO® 202 / 710 / 809 devices with meteorological sensor FMD7 60

Technical data and functions

The sensor connection cable, mains unit ZB 1024 NA2 (for heating, ventilation, and sensor supply), the junction box, and the sensor's ALMEMO® connection cable are all permanently fitted in the weather-proof housing. (Sensor FMD7-60 should be ordered separately.)

The ALMEMO® measuring instrument is integrated in the DIN rail mounting. The mains unit for the device supply (mains plug assembly, NA9 design) is plugged into the integrated socket. (The measuring instrument should be ordered separately.)

The device receives its continuous 110 / 230 V supply via the mains connection cable. Length = 2 meters (Connection is on the rear of the housing.)

When using devices ALMEMO® 202 / 710, any short-term failures to the supply voltage are bridged; in the case of ALMEMO® 202, this is by means of batteries and in the case of ALMEMO® 710, by means of the integrated rechargeable battery. The ALMEMO® device cannot be operated in sleep mode.

Further variants on request:

For information on protective housing ZB9015AGU for various ALMEMO® measuring instruments performing general applications without meteorological sensor FMD7-60.



Weather-proof housing AG2 for ALMEMO® 202 with meteorological sensor

Weather-proof housing for ALMEMO® 202,
lockable transparent door, mast fixture
integrated rail for fastening ALMEMO® 202 device
including mains unit ZA 1312 NA9 for supplying the device
permanently fitted sensor connection cable for sensor FMD7-60
integrated mains unit for supplying sensor heating and sensor ventilation
Option of weather-proof housing for sensor FMD7 60 **OM9760AG2**

Data logger ALMEMO® 202 with accessories

ALMEMO® 202 professional measuring instrument	MA202
2 measuring inputs, graphics display, keypad controls, batteries	ZB2490HS
DIN rail holder for the measuring instrument	ZA1904SD
Memory connector with micro SD	ZA1919DKU
USB data cable	



Weather-proof housing AG7 for ALMEMO® 710 with meteorological sensor

Weather-proof housing for ALMEMO® 710,
 lockable transparent door, mast fixture
 integrated rail for fastening ALMEMO® 710WG device
 including mains unit ZA 1312 NA9 for supplying the device
 permanently fitted sensor connection cable for sensor FMD7-60
 integrated mains unit for supplying sensor heating and sensor ventilation
 Option of weather-proof housing for sensor FMD7 60 **OM9760AG7**

Data logger ALMEMO® 710 with accessories

ALMEMO® 710WG precision measuring instrument
 in wall-mounted housing,
 10 measuring inputs, display and operation via touch screen
 internal measured value memory, integrated rechargeable battery
 including mains unit NA10 (100 to 240 VAC / 12 VDC)
 and USB data cable **MA710WG**

Option of external memory
Memory connector with micro SD **ZA1904SD**



Weather-proof housing AG8 for ALMEMO® 809 with meteorological sensor

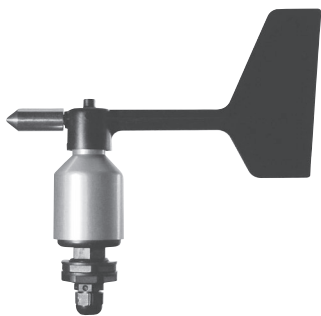
Weather-proof housing for ALMEMO® 809,
 lockable transparent door, mast fixture
 integrated rail for fastening ALMEMO® 809 device
 including mains unit ZB 1212 NA9 for supplying the device
 permanently fitted sensor connection cable for sensor FMD7-60
 integrated mains unit for supplying sensor heating and sensor ventilation
 Option of weather-proof housing for sensor FMD7 60 **OM9760AG8**

Data logger ALMEMO® 809 with accessories

ALMEMO® 809 precision measuring instrument
 9 measuring inputs
 operation via ALMEMO® Control software
 internal measured value memory
 including mains unit NA10 (100 to 240 VAC / 12 VDC)
DIN rail holder for the measuring instrument **MA809**
USB data cable **OA2290HS**
ZA1919DKU

Option of external memory
Memory connector with micro SD **ZA1904SD**

Wind Direction Sensor FVA 614



- Wind direction sensor for measuring the horizontal wind direction.
- Wind vane made from robust plastic, electronics in weather-resistant aluminum housing, rotating mechanism on friction bearings.
- A special labyrinth reliably protects without friction and guards against water penetrating into the housing.
- Electronically controlled heating for operation in winter conditions to prevent bearings and external rotating parts from freezing.

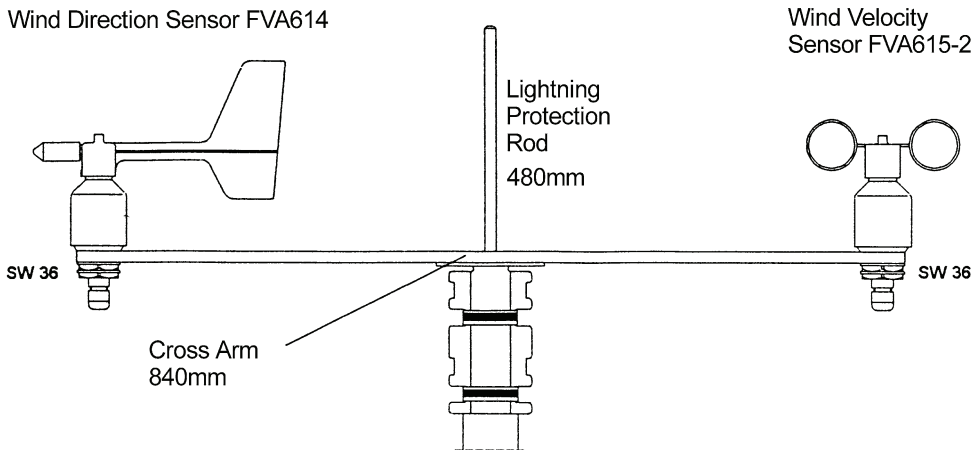
Technical Data

Measuring range:	0 to 360°
Accuracy:	±5°
Resolution:	11.25° (5 bit Gray code)
Measuring principle:	optoelectronically (slotted disk)
Sensor power supply:	9–30VDC through ALMEMO® device
Heating:	24VAC/DC max. 20W
Operative range:	-30 to +70 °C, with heating
Cable:	12m long, LiYCY 6 x 0.25mm²

Connection:	Adapter cable with ALMEMO® connector including supply cable for heating (length 1.5 m, free ends) A mains supply unit must be provided by the user on site.
Installation:	e.g. pole tube with holding thread PG21 / drilling 29mm Ø
Weight	1100 g

Type	Order no.
Wind vane including ALMEMO® connector (0–2V) with 12m cable	FVA614

Accessories for wind direction and wind velocity sensors	Order no.
Cross-arm for separate wind direction and wind velocity sensors inclusive assembly utilitis for mast Ø 48 to 102 mm	ZB9015TC
Lightning protection rod	ZB9015BS



Wind Velocity Sensor FVA 615 2



- Wind velocity sensor for measuring the horizontal wind velocity.
- Cup-type made from robust plastic, electronics in weather-resistant aluminum housing, rotating mechanism on friction bearings.
- A special labyrinth reliably protects without friction and guards against water penetrating into the housing.
- Electronically controlled heating for operation in winter conditions to prevent bearings and external rotating parts from freezing.

Technical Data

Measuring range:	0.5 to 50m/s	Connection:	Adapter cable with ALMEMO® connector including supply cable for heating (length 1.5 m, free ends) A mains supply unit must be provided by the user on site.
Accuracy:	±0.5m/s ±3% of meas. value	Installation:	e.g. pole tube with holding thread PG21 / drilling 29mm Ø
Resolution:	0.1m/s	Weight	750 g
Measuring principle:	optoelectronically (slotted disk)		
Sensor power supply:	9–30VDC through ALMEMO® device		
Heating:	24VAC/DC max. 20W		
Operative range:	-30 to +70 °C, with heating		
Cable:	12m long, LiYCY 6 x 0.25mm2		

Type	Order no.
Cup-type anemometer including ALMEMO® connector (0–2V) with 12m cable	FVA6152

Global Radiation Probe Head FLA 613 GS



- Measuring head in anodized aluminium housing with a plastic dome that is transparent to UV light.
- Rain and splash-proof system, additionally with desiccant to prevent dome from inside condensation.
- Particularly suitable for outdoor measurements, e.g. in medical and biological research, weather information and forecast systems, climatology, agriculture and for general public information.

Technical Data

Measuring range:	0 to approx. 1200W/m ²	Cos correction:	error f2 < 3%
Spectral sensitivity:	400nm to 1100nm	Linearity:	< 1%
Maximum spectral sensitivity:	780nm	Absolute error:	< 10%
Signal output:	0V to 2V	Residual voltage: (E = 0)	< 10mV
Power supply:	+5V to +15V	Nominal temperature:	22°C ±2°C
Mounting:	2 screws M4, in base plate	Operating temperature:	-20°C to +60°C
Cable passage:	downwards	Dimensions:	housing: 55 mm high dome 40 mm high diameter: 80 mm
Housing:	anodized aluminium	Weight:	approx. 300 g
Diffusor:	PTFE		
Dome:	PMMA		

Option	Order no.
Longer cable Total length = 5 meters	OA9613K05
Type (including test protocol)	Order no.
Weather-proof measuring head for measuring the global radiation, incl. ALMEMO® connector with 1.5m cable	FLA613GS
Factory calibration KL90xx radiation for sensor (see chapter Calibration certificates)	

Illuminance measuring head FLA 613 VLM



- Measuring head in anodized aluminum housing, with UV-transparent plastic dome.
- Rain-proof, splash-protected system, with desiccant to prevent condensation forming on the inside of the dome.
- Especially suitable for measuring operations outdoors, e.g. in medical, biological, and climate research, in weather information forecast systems, in agriculture, and for the purposes of general information for the public.
- The spectral sensitivity of the receiver corresponds approximately to that of the human eye.

Technical Data

Measuring range :	0 to 170 klux (approx. 250 W/m ²)	Cos correction :	error f2 <3%
Spectral sensitivity :	360 to 760 nm	Linearity :	<1%
Max. spectral sensitivity :	550 nm	Absolute error :	< 10 %
Signal output	0 to 2 V	Residual voltage (E = 0) :	<10 mV
Power supply :	+5 to +15 V	Nominal temperature :	22 ± 2 °C
Mounting :	2 screws, M4, in base plate	Operating temperature :	-20 to +60 °C
Cable passage :	downwards	Dimensions :	Housing : 55 mm high Dome : 40 mm high Diameter : 80 mm
Housing :	anodized aluminum	Weight :	approx. 300 g
Diffusor :	PTFE		
Dome :	PMMA		

Type (including test protocol)	Order no.
Weather-resistant measuring head for measuring the illuminance including cable, 1.5 m, and ALMEMO® connector	FLA613VLM
Factory calibration KL90xx radiation for sensor (see chapter Calibration certificates)	

UVA Radiation Probe Head FLA 613 UVA



- Measuring head in anodized aluminium housing with a plastic dome that is transparent to UV light.
- Rain and splash-proof system, additionally with desiccant to prevent dome from inside condensation.
- Particularly suitable for outdoor measurements, e.g. in medical and biological research, weather information and forecast systems, climatology, agriculture and for general public information.

Technical Data

Measuring range:	0 to approx. 3mW/cm ²	Cos correction:	error f2 < 3%
Spectral sensitivity:	310 to 400nm	Linearity:	< 1%
Maximum spectral sensitivity:	335nm	Absolute error:	< 10%
Signal output:	0V to 2V	Residual voltage: (E = 0)	< 10mV
Power supply:	+5V to +15V	Nominal temperature:	22°C ±2°C
Mounting:	2 screws M4, in base plate	Operating temperature:	-20°C to +60°C
Cable passage:	downwards	Dimensions:	housing: 55 mm high dome 40 mm high diameter: 80 mm
Housing:	anodized aluminium	Weight:	approx. 300 g
Diffusor:	PTFE		
Dome:	PMMA (transparent to UV)		

Type (including test protocol)

Weather-proof measuring head for measuring the UVA radiation including cable, 1.5 m, and ALMEMO® connector

Factory calibration KL90xx radiation for sensor (see chapter Calibration certificates)

Order no.

FLA613UVA

UVB RadiationProbe Head FLA 613 UVB



- Measuring head in anodized aluminium housing with a plastic dome that is transparent to UV light.
- Rain and splash-proof system, additionally with desiccant to prevent dome from inside condensation.
- Particularly suitable for outdoor measurements, e.g. in medical and biological research, weather information and forecast systems, climatology, agriculture and for general public information.

Technical Data

Measuring range:	0 to approx. 50mW/cm ²	Cos correction:	error f2 < 3%
Spectral sensitivity:	265 to 315nm	Linearity:	< 1%
Maximum spectral sensitivity:	297nm	Absolute error:	< 10%
Signal output:	0V to 2V	Residual voltage: (E = 0)	< 10mV
Power supply:	+5V to +15V	Nominal temperature:	22°C ±2°C
Mounting:	2 screws M4, in base plate	Operating temperature:	-20°C to +60°C
Cable passage:	downwards	Dimensions:	housing: 55 mm high dome 40 mm high diameter: 80 mm
Housing:	anodized aluminium	Weight:	approx. 300 g
Diffusor:	PTFE		
Dome:	PMMA (transparent to UV)		

Type (including test protocol)

Weather-proof measuring head for measuring the UVB radiation including cable, 1.5 m, and ALMEMO® connector

Factory calibration KL90xx radiation for sensor (see chapter Calibration certificates)

Order no.

FLA613UVB

Star Pyranometer FLA 628 S



- Star pyranometer, according to Dirmhirm, for measuring the global radiation, the sky radiation and the short-wave radiation.
- Independent from ambient temperature through differential temperature measurement.
- Cut precision glass cupola for shielding from external environmental effects.
- Levelling by 3 setting screws and an integrated bubble

Technical Data

Measuring range:	0 to 1500W/m²	Nominal temperature:	22°C ±2°C
Resolution:	0.1W/m²	Linearity:	<0.5% (0.5 to 1330W/m²)
Spectral range:	0.3 to 3µm	Stability:	<1% of the meas. range per year
Output:	approx. 15mV/Wm ⁻²	Settling time:	25s (t ₉₅)
Impedance:	approx. 35ohms	Dimensions:	160mm Ø, 75mm high, hole circle: 134mm Ø, holes: 8mm Ø
Operative range:	-40 to +60°C	Weight:	1 kg
Accuracy:	cosine effect + azimuth effect + temperature influence		
Cosine effect:	<3% of measured value (0 to 80° inclination)		
Inclination azimuth effect:	< 3% of meas. val.		
Temperature influence:	< 1% of meas. val. (-20 to +40°C)		

Accessories	Order no.
Shadow belt with stand	ZB9628SB

Type (including test protocol)	Order no.
Star pyranometer including 3m cable with ALMEMO® connector and programmed calibration value	FLA628S
Factory calibration KL90xx radiation for sensor (see chapter Calibration certificates)	

Other variants are available on request



Probe for measuring global radiation FLA 613 T1B11,
3-mode sensor : It measures UVA, VIS, IRA radiation.
Spectral sensitivity from 315 to 1100 nm



Probe for measuring global radiation FLA 613 GS-SDEK,
This measures the global, direct, and diffused solar radiation
(integrated shadow bar).
Spectral sensitivity from 380 to 1100 nm

Digital sensor for temperature, humidity, atmospheric pressure FHAD 46-C4AG in protective all-weather housing with ALMEMO® D6 plug



On request

Temperature sensor Pt100
in protective all-weather housing

FPA930AG

- All relevant ambient parameters are measured with one sensor.
- Suitable for mounting on a wall or a mast
- Sensor cable up to 100 meters long, clamped in terminal box
- All sensors in 1 multi-sensor module: capacitive digital sensor for humidity and temperature, digital atmospheric pressure sensor. Additional EEPROM data storage medium in the sensor module
- The sensor module is thoroughly adjusted. All sensor characteristic and adjustment data are stored in the data storage medium of the sensor module itself. In the process of readjusting the individual sensors, the adjustment values are directly saved in the data storage medium of the sensor module.
- Replacement sensor modules are inexpensive: The sensor module is pluggable and can be simply exchanged on-site. Full accuracy without any adjustment, especially with calibrated sensors. The ALMEMO® connecting cable and the ALMEMO® measuring instrument have no influence on the calibration.
- **new:** The atmospheric pressure is measured directly at the measuring point in the sensor tip. Hence, the atmospheric pressure dependent humidity variables are automatically pressure compensated.
- Humidity calculation on the basis of formulae as per Dr. Sonntag and the enhancement factor as per W. Bögel (correction factor $fw(t,p)$ for real mixed gas systems). This substantially widens the measuring range and improves the accuracy of humidity variable calculations.
- Humidity variables: Absolute humidity in g/m^3 .
- The humidity variables are calculated from the three primary measuring channels (real measurable variables): temperature, humidity and atmospheric pressure.
- Four measuring channels are programmed (ex factory): temperature ($^{\circ}C$, T , t), relative humidity ($\%H$, RH , U_w), dew point ($^{\circ}C$, DT , td), atmospheric pressure (mbar, AP , p). Alternatively further humidity variables are selectable. Mixture (g/kg , MH , r), absolute humidity (g/m^3 , AH , dv), vapor pressure (mbar, VP , e), enthalpy (kJ/kg , En , h). The configuration is performed on the ALMEMO® V7 measuring instrument or directly on the PC using the USB adapter cable ZA1919AKUV (Chapter "Network technology").

Technical Data

Operative range		-30 to +60 °C, 5 to 98 % RH	
Digital temperature / humidity sensor (including A/D converter)			
Humidity			
Measuring range	0 to 98 % RH		
Sensor	CMOSens® technology		
Accuracy	±2.0 % RH in range 10 to 90 % RH		
	±4.0 % RH in range 5 to 98 % RH at nominal temperature		
Hysteresis	typical ±1 % RH		
Nominal temperature	+23 °C ±5 K		
Sensor operating pressure	Atmospheric pressure		
Temperature			
Sensor	CMOSens® technology		
Accuracy	typical ±0.2 K at 5 to 60 °C		
	maximum ±0.4 K at 5 to 60 °C		
	maximum ±0.7 K at -20 to +80 °C		
Reproducibility	typical ±0.1 K		
Digital atm. pressure sensor (integrated in the multi-sensor module)			
Measuring range	700 to 1100 mbar		
Accuracy	±2.5 mbar (at 23 °C ±5 K)		
ALMEMO® connecting cable			
PVC, for available lengths see variants with ALMEMO® D6 plug			
ALMEMO® D6 plug			
Refresh time	1 second for all four channels		
Supply voltage	6 to 13 VDC		
Current consumption	12 mA		
Mechanical design			
Sensor tube	Plastic, diameter 12 mm		
Filter cap	Metal-mesh filter, SK7		
All-weather protection	Ø 105 mm, height approx. 110 mm		
Terminal box	51 x 53 x 36 mm		
Screw-fit cable gland	Splash-protected		

Accessories	Order no.
ALMEMO® transmitter 2450-1 with double analog output 10 V or 20 mA (For other data, options, accessories, see page 01.50)	MA24501R02

Standard delivery	Order no.
Digital sensor for temperature, humidity, atmospheric pressure in protective all-weather housing with connecting cable and ALMEMO® D6 plug, manufacturer's test certificate, 2 fixtures for mounting on a mast	
Connecting cable	
Length = 5 meters	FHAD46C4AGL05
Length = 10 meters	FHAD46C4AGL10
Length = 20 meters	FHAD46C4AGL20
Length = 40 meters	FHAD46C4AGL40
Length = 100 meters	FHAD46C4AGL100
Replacement multi-sensor module, digital, adjusted, plug-in	FH0D46C

DAkkS or factory calibration KH9xxx, temperature, humidity, and KD92xx, atmospheric pressure, for digital sensor (see chapter Calibration certificates).
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.