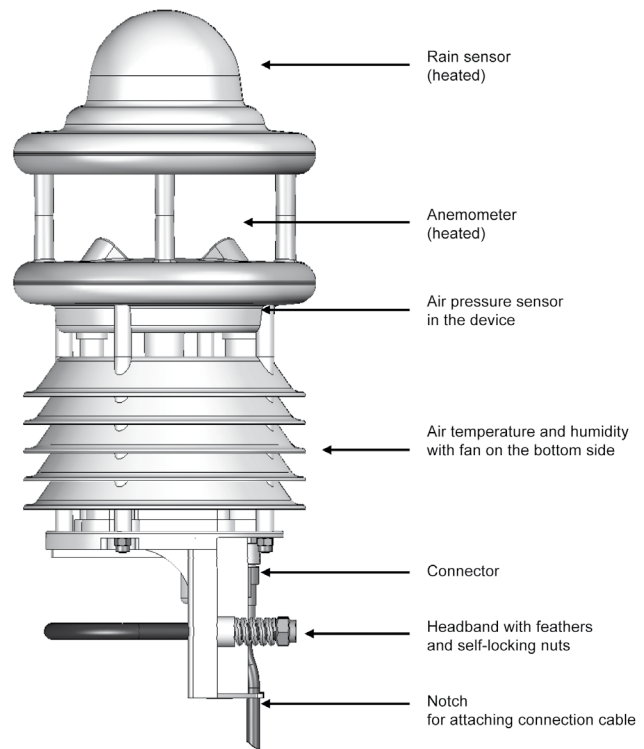


Compact meteorological transducer for professional use - FMD760

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. 24 V from the mains unit, max. 1,8 A. 12 V from ALMEMO® device, typ. 10 mA.	
Sampling rate	1 minute	Supply without mains unit 24V (mobile operation):	
ALMEMO® D7 quantities	Current momentary value, average value, minimum value, maximum value (at output cycle)	Fan and heating deactivated. 12 V from ALMEMO® device, typ. 130 mA with rainfall radar in continuous operation.	
Atmospheric humidity		Operating in Energy Saver mode 1: typ. 25 mA, no rain test / no rain, typ. 130 mA for 2 s / Min in the rain test, typ. 130 mA continuously, in the rain	
Measuring method	capacitive		
Measuring range	0 to 100 % RH		
Resolution	0.1 % RH		
Accuracy sensor	±2 % RH		
Sampling rate	1 minute		
ALMEMO® D7 quantities	Current momentary value		
Atmospheric pressure			
Measuring method	MEMS sensor, capacitive		

Accessories

Sensor connection cable, free ends	Length = 20 meters	Order no.
Sensor connection cable, free ends	Length = 100 meters	ZB9760AK20
Overvoltage arrester (for stationary operation)		ZB9760AK100
		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 calibration KM90xxxD temperature, humidity, atmospheric pressure wind velocity or factory calibration KM90xxW temperature, humidity, atmospheric pressure wind velocity wind direction rainfall for digital sensor (see chapter Calibration certificates).