

## Digital ALMEMO® D6 measuring module for AC voltage and AC current

For acquiring the true root mean square (RMS) value of a sinusoidal AC signal. Sampling rate of 1000 mops.  
 Overvoltage proof measuring input. Galvanically isolated up to 6 kV.  
 For connection to all ALMEMO® V6 / V7 measuring instruments



ZAD 903-ABx

ZAD 904-ABx

### Applications

ALMEMO® D6 measuring modules can be used for a wide variety of applications. Examples:

- Inexpensive monitoring of several AC voltage signals with a large number of measuring modules
- Monitoring the supply voltage and the current consumption of machines, motors, and other consumers.
- Checking switches.
- Monitoring of the electrical parameters voltage, in addition to the physical measured variables such as temperature, pressure, air flow, flow rate, etc.
- Voltage and / or current measurement of 1-phase user (230 V AC) through a touch-proof Schuko-socket outlet adapter (accessory).

### Technical data and function

- The digital ALMEMO® D6 measuring module uses its own integrated AD converter. The overall accuracy of the measurement is independent from the ALMEMO® display unit/data logger.
- The AC signal with sinusoidal curve progression is digitalized at the integrated AD converter at a high sampling rate and based on that, the true RMS value will be calculated continuously. At the same time, the frequency of the AC signal will be determined.
- The measured values are digitally interrogated by the ALMEMO® measuring device at the conversion rate of the measuring device.
- The ALMEMO® measuring instrument saves the measured values and the measuring software WinControl will display them graphically.
- The measuring input is overvoltage proof and galvanically isolated from the ALMEMO® measuring device.

### Technical data

Input sockets:	Safety sockets CAT III, 20 A, Ø 4 mm	Nominal conditions:	Alternating signal: sinusoidal 50 Hz, 23 °C ±2 K, 10 to 90 % RH (non-condensing)
Galvanic isolation:	6 kV	Temperature drift:	max. 0.003 %/K (30 ppm/K)
Sampling rate:	1 kHz internal	Suitable conditions:	+5 to +40 °C (Storage temperature: -20 to +60 °C), 10 to 90 % RH (non-condensing), maximum height above mean sea level: 2000 m
Refresh rate:	0.5 s	Housing:	ABS, 127 x 83 x 42 mm (LxWxH)
AC signals U, I:	only sinusoidal signals, no signals with phase angle control	Connecting cable:	2 m, permanently connected
Response threshold U, I:	Signal U and I > 1 % of fin. val.	ALMEMO® D6-plug:	for measuring channels, see Types, configuration via ALMEMO® device
Operating range U, I, P:	DC ... 250 Hz	Supply voltage:	9 to 12 V via ALMEMO® device
Measuring range U, I, P:	see Types	Current consumption:	approx. 80 mA (plug and module)
Resolution:	see Types		
Overload:	see Types		
Internal resistance:	see Types		
Accuracy:	±0.1 % of fin. val. ±2 Digit		
Measuring range frequency:	20 to 250 Hz		
Resolution:	0.01 Hz		

**Accessories****Order no.**

DIN rail mounting

**ZB2490HS**

Magnetic fastening

**ZB2490MH**

Socket adapter: max. 230 V AC / 16 A

**ZE2000PA**

Earthed socket for the consumer. 3 safety jacks: voltage, current, COM.

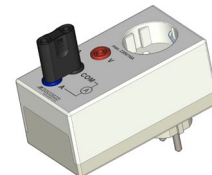
Incl. short-circuit plug for current path. Housing: W 65 x H 120 mm



DIN rail mounting



Magnetic fastening



Socket adapter

ALMEMO® extension cable, length = 2 m (see chapter 6)

**ZA9060VK2**

ALMEMO® extension cable, length = 10 m (see chapter 6)

**ZA9090VKC10****Types**

Measuring module including touch proof connecting cable, ALMEMO® connection cable permanently connected to the ALMEMO® D6 plug

**AC voltage**

2 ALMEMO® measuring channels: voltage, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
25 V <sub>RMS</sub> AC	0.01 V	±60 V <sub>RMS</sub>	1 MOhm	<b>ZAD903AB3</b>
400 V <sub>RMS</sub> AC	0.1 V	±400 V <sub>RMS</sub>	4 MOhm	<b>ZAD903AB5</b>

**AC current**

2 ALMEMO® measuring channels: current, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
1.8 A <sub>RMS</sub> AC	0.001 A	±4 A <sub>RMS</sub>	100 mOhm	<b>ZAD904AB1</b>
10 A <sub>RMS</sub> AC*	0.01 A	±20 A <sub>RMS</sub>	8 mOhm	<b>ZAD904AB3</b>

\* Extended range up to 20 A<sub>RMS</sub> without specification. Continuous operation up to a maximum of 10 A<sub>RMS</sub>. For currents exceeding 10 A<sub>RMS</sub>, the maximum measuring period is 10 minutes. After that, the device needs to cool down to room temperature.

**Other version****ALMEMO® D7 measuring module ZED7 3x-ABx**

see chapter 11

Power calculation via simultaneous measurement of voltage and current in one measuring module or acquisition of fast signal changes during switch-on / switch-off processes.



## Fast digital ALMEMO® D7 measuring module for AC voltage / AC current / AC power

For acquiring the true root mean square (RMS) value of a sinusoidal AC signal. Sampling rate of 1000 mops. Overvoltage proof measuring input. Galvanically isolated up to 6 kV.  
For connecting current ALMEMO® V7 measuring instruments: ALMEMO® 500, 710, 809, 202-S, 204



ZED7 30-ABx



ZED7 31-ABx



ZED7 37-ABxx

### Applications

ALMEMO® D7 measuring modules can be used for a wide variety of applications. Examples:

- Inexpensive monitoring of several AC voltage signals with a large number of measuring modules
- Monitoring the supply voltage and the current consumption during switch-on and switch-off processes of machines, motors, and other consumers.
- Checking switches and circuit breakers using fast switching cycles.
- Measuring the response time of electronic switches
- Power calculation (effective power, power factor) through the parallel measurement of voltage and electricity in one measuring module.
- Monitoring of the electrical parameters voltage, electricity and power through inverter in photovoltaic systems with parallel documentation of the environmental parameters like temperature, global radiation and other meteorological measuring variables.
- Recording of quick power changes during loading tests with quick load changes.
- Power measurement of 1-phase user (230 V AC) through a touch-proof Schuko-socket outlet adapter (accessory).
- Recording of the power consumption of mobile machines (cleaning machines, high-pressure cleaner amongst others) and of domestic devices (refrigerators, radiant heater, ovens amongst others) additionally to the physical measuring variables like temperature, pressure, air velocity, flow rate amongst others.

### Technical data and function

- The digital ALMEMO® D7 measuring module uses its own integrated AD converter. The overall accuracy of the measurement is independent from the ALMEMO® V7 display unit/data logger. On the ALMEMO® V7 measuring instrument all D7 measuring plugs work in parallel using their own measuring rate.
  - The AC signal with sinusoidal curve progression is digitalized at the integrated AD converter at a high sampling rate and based on that, the true RMS value will be calculated continuously. At the same time, the frequency of the AC signal will be determined.
- The power measuring modules will measure voltage as well as current synchronically and based on these two, the effective power and the performance factor will be calculated.
- The ALMEMO® V7 measuring instrument saves the measured values and the measuring software WinControl will display them graphically.
  - The measuring input is overvoltage proof and galvanically isolated from the ALMEMO® V7 measuring device.

### Technical data

Input sockets:	Safety sockets CAT III, 20 A, Ø 4 mm	Performance factor $\cos\varphi$ :	0.17 to 1 precondition: zero crossings!
Galvanic isolation:	6 kV	Resolution:	0.01
Sampling rate:	1 kHz internal	Nominal conditions:	Alternating signal: sinusoidal 50 Hz, 23 °C ±2 K, 10 to 90 % RH (non-condensing)
Output cycle / settling time:	4 periods (max. 200 ms) e.g. at 50 Hz: 80 ms (approx. 12 mops)	Temperature drift:	max. 0.003 %/K (30 ppm/K)
AC signals U, I:	only sinusoidal signals, no signals with phase angle control	Suitable conditions:	+5 to +40 °C (Storage temperature: -20 to +60 °C), 10 to 90 % RH (non-condensing), maximum height above mean sea level: 2000 m
Response threshold U, I:	Signal U and I > 1 % of fin. val.	Housing:	ABS, 127 x 83 x 42 mm (LxWxH)
Operating range U, I, P:	DC ... 250 Hz	Connecting cable:	2 m, permanently connected
Measuring range U, I, P:	see Types	ALMEMO® D7-plug:	for measuring channels, see Types, configuration via ALMEMO® V7 device
Resolution:	see Types	Supply voltage:	9 to 12 V via ALMEMO® device
Overload:	see Types	Current consumption:	approx. 60 mA (plug and module)
Internal resistance:	see Types		
Accuracy:	±0.1 % of fin. val. ±2 Digit		
Measuring range frequency:	20 to 250 Hz		
Resolution:	0.01 Hz		

## Accessories

## Order no.

DIN rail mounting

ZB2490HS

Magnetic fastening

ZB2490MH

Socket adapter: max. 230 V AC / 16 A

ZE2000PA

Earthed socket for the consumer. 3 safety jacks: voltage, current, COM.

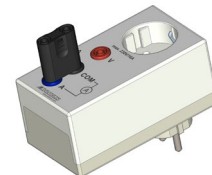
Incl. short-circuit plug for current path. Housing: W 65 x H 120 mm



DIN rail mounting



Magnetic fastening



Socket adapter

## Types

Measuring module including touch proof connecting cable, ALMEMO® connection cable permanently connected to the ALMEMO® D7 plug

## AC voltage

2 ALMEMO® measuring channels: voltage, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
25 V <sub>RMS</sub> AC	0.01 V	±60 V <sub>RMS</sub>	1 MOhm	ZED730AB3
400 V <sub>RMS</sub> AC	0.1 V	±400 V <sub>RMS</sub>	4 MOhm	ZED730AB5

## AC current

2 ALMEMO® measuring channels: current, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
1.8 A <sub>RMS</sub> AC	0.001 A	±4 A <sub>RMS</sub>	100 mOhm	ZED731AB1
10 A <sub>RMS</sub> AC*	0.01 A	±20 A <sub>RMS</sub>	8 mOhm	ZED731AB3

\* Extended range up to 20 A<sub>RMS</sub> without specification. Continuous operation up to a maximum of 10 A<sub>RMS</sub>. For currents exceeding 10 A<sub>RMS</sub>, the maximum measuring period is 10 minutes. After that, the device needs to cool down to room temperature.

## AC power

5 ALMEMO® measuring channels: voltage, current, effective power, frequency, performance factor cosφ

Measuring range voltage**	Measuring range current**	Measuring range power (calculated)	Resolution power	Order no.
400 V <sub>RMS</sub> AC	1.8 A <sub>RMS</sub> AC	720 W	1 W	ZED737AB51
400 V <sub>RMS</sub> AC	10 A <sub>RMS</sub> AC*	8 kW	0.01 kW	ZED737AB53

\* Extended range up to 20 A<sub>RMS</sub> without specification. Continuous operation up to a maximum of 10 A<sub>RMS</sub>. For currents exceeding 10 A<sub>RMS</sub>, the maximum measuring period is 10 minutes. After that, the device needs to cool down to room temperature.

\*\* Resolution, Overload, Input resistance see further above.