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		
Sampling rate:	1 kHz internal	Temperature drift:	max. 0.003 %/K (30 ppm/K)
Refresh rate:	0.5s	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
AC signals U,I:	only sinusoidal signals, no signals with phase angle control		
Response threshold U,I:	Signal U and I > 1 % of fin. val.		
Operating range U, I, P:	DC … 250 Hz		
Measuring range U, I, P:	see Types	Housing:	ABS, 127 x 83 x 42 mm (LxWxH)
Resolution:	see Types	Connecting cable:	2 m, permanently connected
Overload:	see Types	ALMEMO® D6-plug:	for measuring channels, see Types, configuration via ALMEMO® device
Internal resistance:	see Types		
Accuracy:	±0.1% of fin. val. ±2 Digit	Supply voltage:	9 to 12 V via ALMEMO® device
Measuring range frequency:	20 to 250 Hz	Current consumption:	approx. 80 mA (plug and module)
Resolution:	0.01 Hz		

Accessories

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 = 4 m (see chapter 6)	**ZA9060VK4**
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_{RMS} AC	0.01 V	±60 V_{RMS}	1 MOhm	**ZAD903AB3**
400 V_{RMS} AC	0.1 V	±400 V_{RMS}	4 MOhm	**ZAD903AB5**

AC current
2 ALMEMO® measuring channels: current, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
1,8 A_{RMS} AC	0.001 A	±4 A_{RMS}	100 mOhm	**ZAD904AB1**
10 A_{RMS} AC*	0.01 A	±20 A_{RMS}	8 mOhm	**ZAD904AB3**

* Extended range up to 20 A_{RMS} without specification. Continuous operation up to a maximum of 10 A_{RMS}. For currents exceeding 10 A_{RMS}, 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.

DAkkS or factory calibration KE90xx electrical for digital measuring module, see chapter „Calibration certificates".
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

Electrical variables

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 (refrigeratros, 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
Galvanic isolation:	6 kV
Sampling rate:	1 kHz internal
Output cycle / settling time:	4 periods (max. 200 ms) e.g. at 50 Hz: 80 ms (approx. 12 mops)
AC signals U,I:	only sinusoidal signals, no signals with phase angle control
Response threshold U,I:	Signal U and I > 1 % of fin. val.
Operating range U, I, P:	DC … 250 Hz
Measuring range U, I, P:	see Types
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

Performance factor cosφ:	0.17 to 1 precondition: zero crossings!
Resolution:	0.01
Nominal conditions:	Alternating signal: sinusoidal 50 Hz, 23 °C ±2 K, 10 to 90% RH (non-condensing)
Temperature drift:	max. 0.003 %/K (30 ppm/K)
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
Housing:	ABS, 127 x 83 x 42 mm (LxWxH)
Connecting cable:	2 m, permanently connected
ALMEMO® D7-plug:	for measuring channels, see Types, configuration via ALMEMO® V7 device
Supply voltage:	9 to 12 V via ALMEMO® device
Current consumption:	approx. 60 mA (plug and module)

Accessories

<div align="right">Order no.</div>

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_{RMS} AC	0.01 V	±60 V_{RMS}	1 MOhm	**ZED730AB3**
400 V_{RMS} AC	0.1 V	±400 V_{RMS}	4 MOhm	**ZED730AB5**

AC current

2 ALMEMO® measuring channels: current, frequency

Measuring range	Resolution	Overload	Input resistance	Order no.
1,8 A_{RMS} AC	0.001 A	±4 A_{RMS}	100 mOhm	**ZED731AB1**
10 A_{RMS} AC*	0.01 A	±20 A_{RMS}	8 mOhm	**ZED731AB3**

* Extended range up to 20 A_{RMS} without specification. Continuous operation up to a maximum of 10 A_{RMS}. For currents exceeding 10 A_{RMS}, 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_{RMS} AC	1.8 A_{RMS} AC	720 W	1 W	**ZED737AB51**
400 V_{RMS} AC	10 A_{RMS} AC*	8 kW	0.01 kW	**ZED737AB53**

* Extended range up to 20 A_{RMS} without specification. Continuous operation up to a maximum of 10 A_{RMS}. For currents exceeding 10 A_{RMS}, 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.

DAkkS or factory calibration KE90xx electrical for digital measuring module, see chapter „Calibration certificates".
DAkkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.