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Instruction Manual

Fast ALMEMO® measuring module for voltage, current and power

Voltage DC ZED7 00-ABx
Current DC ZED7 01-ABx
Power DC ZED7 07-ABxy
Voltage AC ZED7 30-ABx
Current AC ZED7 31-Aby
Power AC ZED7 37-ABxy

D7 technology
English
V 2.7
25.10.2022

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2 Explanation of Symbols

	Safety note
!	Requirement
→	Request
	Notice
➢	Result
Back	Text displayed in a software

3 Safety Notes 

→ The measuring modules are – depending on the type – able to measure voltages, currents and powers for potentials above 50V. During operation and especially when connecting the measuring module and the socket adapter, make sure that you do not touch any high voltage components.

→ For the connection of the measuring modules for AC/DC signals and for the connection of the socket adapter, use the supplied or equivalent touch-protected connection cables.

→ The measuring module for DC signals must only be used for direct voltage respectively direct current according to the measuring range indicated on the type plate.

→ Be particularly careful that the current modules are always connected in series to the consumer i.e. in an input lead, and that they must not be directly connected to the voltage source. When using the socket adapter, the corresponding sockets of the socket adapter and measuring module (A-A , V-V, COM-COM) must be connected to each other. The color of the sockets must be observed here.

→ Never use the measuring device or the measuring module in wet or damp environments.

→ Keep the plastic housing away from open fire and hot surfaces (e.g. burners).

→ The measuring module and the socket adapter must no longer be used if they are externally damaged or possibly no longer function after incorrect connection.

→ In case the measuring module or the socket adapter was used for purposes other than intended or was used incorrectly, we cannot accept any liability for any damages caused as a result.

→ The protective function of the measuring module and socket adapter is impaired if the devices are used in a manner not specified by the manufacturer.

→ The measuring modul internal current measurement path is not intended for continuous operation for currents greater than 10A. In that case, the measurement can only be run for a maximum of 10 minutes. After this period of time, the device must be cooled down to ambient temperature.

→ Only use the socket adapter for the duration of the actual measurement.

3.1 Intended Use

The fast ALMEMO® measuring module for voltage, current, and power is intended for measuring current and voltage signals. These include voltage DC, current DC, power DC, voltage AC, current AC, and frequency. The active power including the power factor will be calculated on the basis of these signals. The measuring module is suitable for voltage measurements up to 400V (DC) and 400V_{eff} (AC) as well as for current measurements up to 20A (DC) respectively 20A $_{eff}$ (AC).

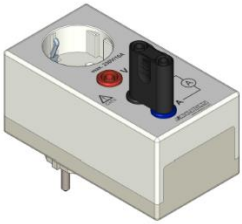
The socket adapter is used as an aid for measuring voltage, current and power on circuits that are electrically connected directly to the low-voltage mains (CAT II). The socket adapter is to be used exclusively for operation with the measuring module. Other modes of operation are not permitted.

4 Product

4.1 Scope of Delivery

→ When unpacking, please pay attention to damages to the measuring instrument as well as to the completeness of the delivery.

☞ The precise compilation of your delivery depends on your purchase order.

Measuring module for		
Voltage DC	ZED7 00-ABx	
Current DC	ZED7 01-ABx	
Power DC	ZED7 07-ABxy	
Voltage AC	ZED7 30-ABx	
Current AC	ZED7 31-ABy	
Power AC	ZED7 37-ABxy	
Optionally available: **Socket adapter incl. short-circuit plug** ZE 2000-PA		
Connection cables	Measuring lead CAT III with a two-way safety connector	
Present Instruction Manual		

→ In the event of a damage caused during transportation, please keep the packaging material and contact the supplier immediately.

→ In case accessories are used that do not comply with the CAT III (500 V) category, the measurement category will decrease to the lowest value of the resulting combination of accessory and measuring module.

4.2 Description

The ALMEMO® AC measuring modules ZED7 30-ABx, ZED7 31-ABy, and ZED7 37-ABxy measure the true root mean square (RMS) value of an AC current signal and / or an AC voltage signal. This means that the measuring signal with any arbitrary shape of curve is digitized at 1kHz and the true RMS value is calculated and displayed on the measuring device.

Measuring modules of the ZED7 37-ABxy types measure the AC current as well as the voltage synchronously and on the basis of these values, the active power and the power factor are determined. The data transmission to the measuring device is done digitally.

The measuring module is galvanically isolated at 6 kV and protected from overvoltage. The measuring module can be connected to every measuring input of any ALMEMO® measuring device of the device generation V7. It is also possible to connect several measuring modules to one measuring device.

The power supply of the measuring module is provided by the ALMEMO® measuring device via a DC/DC converter (isolation voltage 6 kV). The power supply of the measuring device is stressed by approx. 40 mA, i.e. for a long-term operation a mains adapter is required.

True RMS value measurement

The alternating voltage signal is permanently sampled at 1kHz and the total RMS value of DC and AC voltage components is being calculated.

$$V_{eff} = \sqrt{VAC^2 + VDC^2}$$

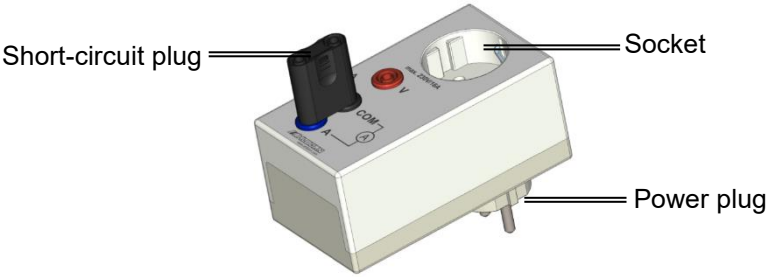
4.3 Order numbers and measuring ranges of the measuring module at delivery

Order Number	Type DC	Range	Measuring Range	Dim.	Resolution
ZED7 00-AB3	voltage				
1. U60.00	60V DC	B-01 **D U602**	-62.00...+62.00.	V	0.01 V
ZED7 00-AB5	voltage				
1. U400.0	400V DC	B-02 **D U4001**	-440.0 ...+440.0	V	0.1 V
ZED7 01-AB1	current				
1.I20.00mA	20 mA DC	B-03 **D I202**	-22.00… +22.00	mA	1 mA
ZED7 01-AB2	current				
1. I200.0mA	200 mA DC	B-04 **D I2001**	-220.0… +220.0	mA	1 mA
ZED7 01-AB3	current				
1. I2.000A	2 A DC	B-05 **D I23**	-2.200… +2.200	A	0.001 A
ZED7 01-AB5	current				
1. I20.00A	20 A DC	B-06 **D I202**	-22.00 …+22.00	A	0.01A
ZED7 07-AB33	power				
1. U60.00	60V DC	B-01 **D U602**	-62.00 ...+62.00.	V	0.01 V
2. I2.000A	2 A DC	B-05 **D I23**	-2.200… +2.200	A	0.001 A
3. P120.0W	120W DC	B-07 **D P1201**	0.0 … 125.0	W	0.1 W
ZED7 07-AB35	power				
1. U60.00	60V DC	B-01 **D U602**	-62.00 ...+62.00.	V	0.01 V
2. I20.00A	20 A DC	B-06 **D I202**	-22.00 …+22.00	A	0.01A
3. P1200W	1.2 kW DC	B-08 **D P122**	0.0 … 1.250	kW	0.001 kW
ZED7 07-AB53	power				
1. U400.0	400V DC	B-02 **D U4001**	-440.0 ...+440.0	V	0.1 V
2. I2.000A	2 A DC	B-05 **D I23**	-2.200 … +2.200	A	0.001 A
3. P800W	800W DC	B-09 **D P8001**	0.0 … 820.0	W	0.1 W
ZED7 07-AB55	power				
1. U400.0	400V DC	B-02 **D U4001**	-440.0 ...+440.0	V	0.1 V
2. I20.00A	20 A DC	B-06 **D I202**	-22.00 …+22.00	A	0.01A
3. P8000W	8 kW DC	B-10 **D P82**	0.00 … 8.20	kW	0.01 kW

	AC				
ZED7 30-AB3	voltage				
1. U25.00	25 V_{eff}	B-01 **D U252**	0,00 … 27.00	V_{eff}	0.01 V_{eff}
2. FREQ	250 Hz	B-08 **D F32**	20.00 … 250.00	Hz	0.01 Hz
ZED7 30-AB5	voltage				
1. U400.0	400 V_{eff}	B-02 **D U4001**	0.0 … 440.0	V_{eff}	0.1 V_{eff}
2. FREQ	250 Hz	B-08 **D F32**	20.00 … 250.00	Hz	0.01 Hz
ZED7 31-AB1	current				
1. I1.800	1,8 A_{eff}	B-03 **D I23**	0.000 … 2.000	A_{eff}	0.001 A_{eff}
2. FREQ	250 Hz	B-08 D F32	20.00 … 250.00	Hz	0.01 Hz
ZED7 31-AB3	current				
1. I20.00	20 A_{eff}	B-04 **D I202**	0.00 … 22.00	A_{eff}	0.01 A_{eff}
2. FREQ	250 Hz	B-08 D F32	20.00 … 250.00	Hz	0.01 Hz
ZED7 37-AB31	power				
1. U25.00	25 V_{eff}	B-01 **D U252**	0,00 … 27.00	V_{eff}	0.01 V_{eff}
2. I1.800	1,8 A_{eff}	B-03 **D I23**	0.000 … 2.000	A_{eff}	0.001 A_{eff}
3. P50.0	45 W	B-05 **D P501**	0.0 … 50.0 W	W	0.1 W
4. FREQ	250 Hz	B-08 **D F32**	20.00 … 250.00	Hz	0.01 Hz
5. LF		B-09 **D LF**	-0.99 … +1.00		0.01
ZED7 37-AB51	power				
1. U400.0	400 V_{eff}	B-02 **D U4001**	0.0 … 440.0	V_{eff}	0.1 V_{eff}
2. I1.800	1,8 A_{eff}	B-03 **D I23**	0.000 … 2.000	A_{eff}	0.001 A_{eff}
3. P800	720 W	B-05 **D P800**	0 … 800 W	W	1 W
4. FREQ	250 Hz	B-08 **D F32**	20.00… 250.00	Hz	0.01 Hz
5. LF		B-09 **D LF**	-0.99 … +1.00		0.01
ZED7 37-AB53	power				
1. U400.0	400 V_{eff}	B-02 **D U4001**	0.0 … 440.0	V_{eff}	0.1 V_{eff}
2. I20.00	20 A_{eff}	B-04 **D I202**	0.00 … 22.00	A_{eff}	0.01 A_{eff}
3. P8000	8 KW	B-07 **D P82**	0.00 … 8.00	kW	0.01 kW
4. FREQ	250 Hz	B-08 **D F32**	20.00… 250.00	Hz	0.01 Hz
5. LF		B-09 **D LF**	-0.99 … +1.00		0.01

4.4 Description socket adapter

The socket adapter with order number ZE 2000-PA is optionally available. It is intended as a safe tool for measuring voltage, current and power on circuits electrically connected directly to the low-voltage network (CAT II). For safety reasons, the short-circuit plug can only be connected to the black socket (COM) and the blue socket (A) and is only used if no current measurement is required and the circuit is only to be closed.



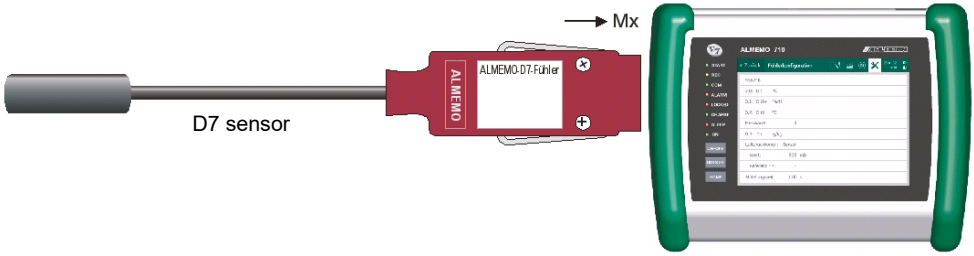
4.5 Digital ALMEMO® D7 measuring sensor

Building on the already self-sufficient ALMEMO®-D6 connectors with serial interface, the possibilities of independence from the measuring device have been consistently further developed and a completely new V7 measuring system has been created. Efficient measurement of fast and slow probes with any range of measured values is possible at the same time. New measurement functions and ranges not supported by the ALMEMO® devices themselves can be configured and used via a menu stored in the probe. This makes the new ALMEMO® V7 system incomparably flexible and future-proof. The communication from sensor to measuring device is generally carried out via a serial interface. This means that the D7 sensors can only be connected to new ALMEMO® V7 devices.

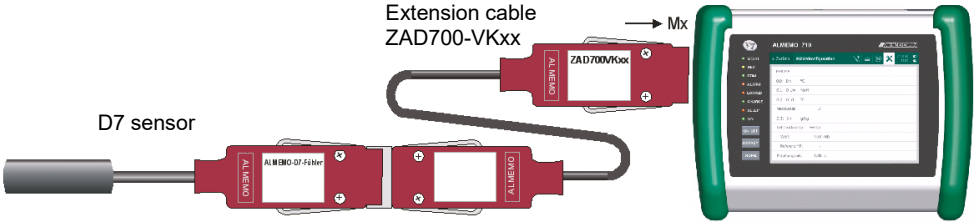
4.6 Operation as probe on ALMEMO® V7 measuring instruments

ALMEMO® D7 sensors supply their final digital measured values of 1 to 10 measuring channels via the serial interface to the ALMEMO® V7 device, where they are simply stored or output. Function channels can only be programmed and used by the device. If a measuring channel is not to be displayed, the measuring

range can be deactivated and also reactivated as usual via the ALMEMO® device. The sensor is supplied via the measuring device.



Extension



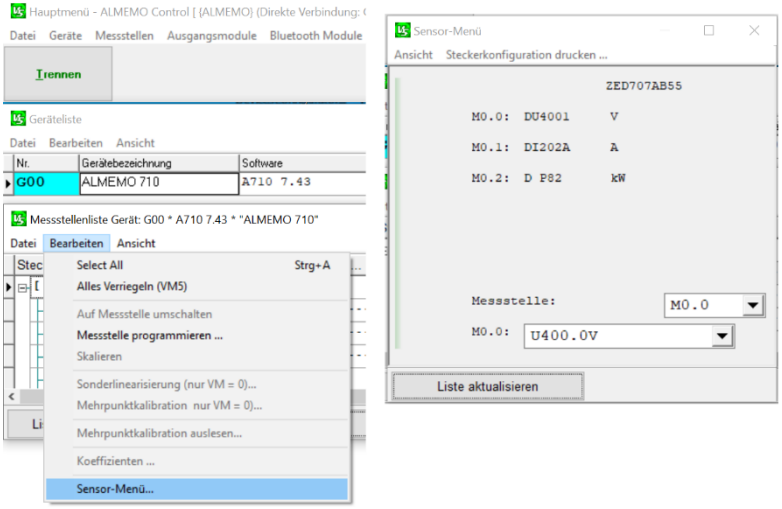
The extension cables ZAD7 00-VKxx are used to extend the probes on the device, where the measured values and the plug programming are transmitted serially interference-free via RS422 drivers. For galvanic isolation there is an additional small adapter cable ZAD7 00-GT.

4.7 Measured value correction

For the primary measuring channels, adjustment values or a multi-point adjustment can be stored in the D7 sensor (ex works or via V7 measuring device with option KL). Correction values (zero point, slope, base, factor) are already processed in the probe.

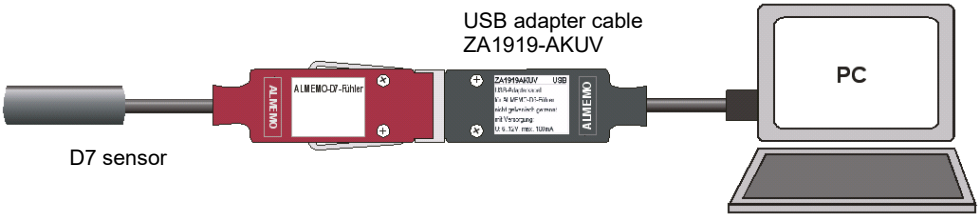
4.8 Sensor menu

In order to maintain the future viability of the new ALMEMO® V7 measuring system for many years without changing the measuring device, each D7 sensor has an individual sensor menu that can be called up via each ALMEMO® V7 measuring device. Thus, it is possible to configure measuring ranges or other specific probe functions. A V7 measuring device or a PC can serve as the operating device.



4.9 Configuration on the PC via USB adapter cable

The ALMEMO® D7 sensor is directly connected to the PC with the USB coupling adapter cable ZA1919-AKUV with a baud rate of 115.2 kBd. A microcontroller in the adapter cable automatically sets the necessary voltage supply as well as baud rate and device address of the sensor.



The ALMEMO® Control program (from v. 5.14.0.330) is used for configuration via the sensor menu. In the measuring point list, the 'Sensor menu' can be found under 'Edit'. Here primarily up to 10 measuring points with the specific D7 measuring ranges of the D7 sensor and further settings can be programmed. The measuring ranges appear on the interface with new meaningful abbreviations. Besides the range, a dimension of up to 6 digits and a comment are automatically programmed and then the channel is locked with 5. Deleting areas is done in the list by selecting '- - -'.

Function channels are either parameters of the measuring device or are calculated by the measuring device. They can therefore only be programmed and used by the device. The following function channels are available:

Batt, Mess, Alrm, Diff, Max, Min, M(t), n(t), M(n), Flow, Time

They cannot be used when connected directly to the PC. The note '!unusable' then appears in the comment.

5 How to run a Measurement with the Measuring Module

While connecting the measuring module, please pay attention to the measuring range indicated on the type plate.

☞ If you want to use the socket adapter as an aid for measuring voltage, current and power on circuits that are electrically connected directly to the low-voltage mains, pay attention to the instructions in chapter 6 ´Using the socket adapter`.

☞ The measuring module features an ALMEMO® D7 plug, on which the measuring range as well as the dimension are predefined. Consequently, the measuring module will automatically be recognized by every ALMEMO® V7 measuring device. It is therefore not necessary to carry out any additional programming.

5.1 How to measure Voltage DC with the Module ZED7 00-ABx

Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

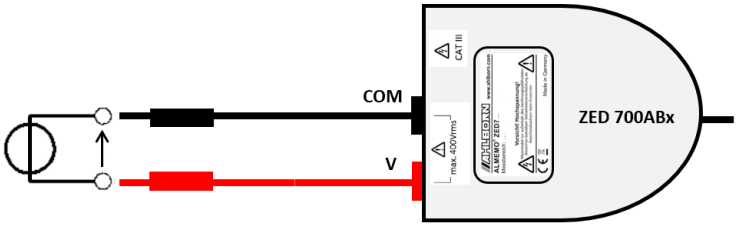
To avoid electric shocks, do not touch any exposed parts or connections during operation.

Use the supplied touch proof connector cables.

1. Switch off the voltage at the voltage source and check that no voltages are present.
2. Connect the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
3. Switch on the ALMEMO® measuring device.

4. Connect the voltage source to the sockets of the measuring module by using the connecting cables whereby the red connecting cable must be connected to the positive pole and the red socket.
5. Switch on the voltage at the voltage source.

➢ The measured values will be displayed on the ALMEMO® measuring device.



Measuring Signal Connector Cables Measuring Module for Voltage

5.2 How to measure Current DC with the Module ZED7 01-ABx

The device internal current measurement path is not intended for continuous operation for currents greater than 10A. In that case, the measurement can only be run for a maximum of 10 minutes. After this period of time, the device must be cooled down to ambient temperature.

Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

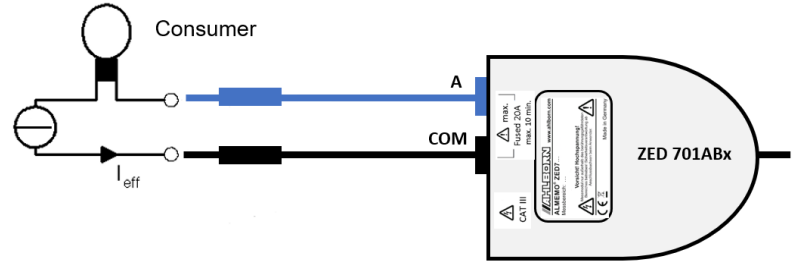
To avoid electric shocks, do not touch any exposed parts or connections during operation.

Use the supplied touch proof connector cables.

With no consumer present do not connect the current measurement module directly to the voltage source. Possible resulting risks are overheating or destruction of the module.

1. Connect a consumer to the current source.

2. Switch off the consumer to make sure that no current flows and check that no voltages are present.
3. Connect the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
4. Switch on the ALMEMO® measuring device.
5. Integrate the measuring module in the current path of the consumer whereby the blue connecting cable must be connected to the positive pole and the blue socket (A). The black connecting cable must be connected to the ground terminal (COM).



Measuring Signal Connector Cables Measuring Module for Current

6. Switch on the consumer.

➢ The measured values will be displayed on the ALMEMO® measuring device.

5.3 How to measure Power DC with the Module ZED7 07-ABxy

The device internal current measurement path is not intended for continuous operation for currents greater than 10A. In that case, the measurement can only be run for a maximum of 10 minutes. After this period of time, the device must be cooled down to ambient temperature.

Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

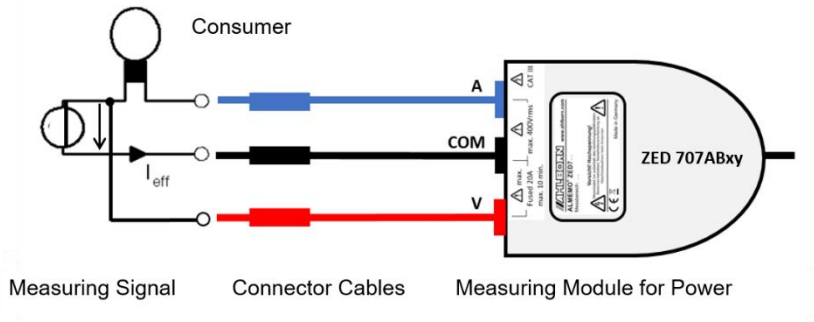
To avoid electric shocks, do not touch any exposed parts or connections during operation.

Use the supplied touch proof connector cables.

With no consumer present do not connect the current measurement module directly to the voltage source. Possible resulting risks are overheating or destruction of the module.

☞ Voltage and current are measured synchronously and the power will be calculated on the basis of those two.

1. Connect a consumer to the current source.
2. Switch off the consumer to make sure that no current flows and check that no voltages are present.
3. Connect the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
4. Switch on the ALMEMO® measuring device.
5. Integrate the measuring module in the measuring path of the consumer via the blue connecting cable (into socket A).
6. Connect the black connecting cable to the black socket (COM) of the measuring module and directly to the voltage source. It should be noted that the middle socket (COM) represents the ground potential of the measuring module.
7. Using the red connecting cable, connect the red socket (V) directly to the voltage source.



8. Switch on the consumer.

➢ The measured values will be displayed on the ALMEMO® measuring device.

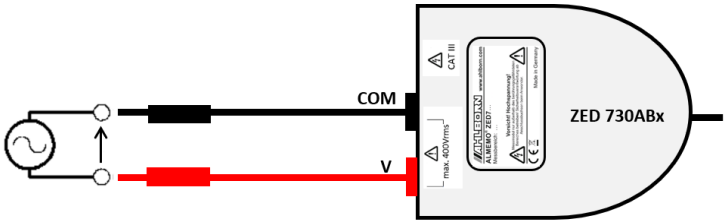
5.4 How to measure Voltage AC with the Module ZED7 30-ABx

Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

To avoid electric shocks, do not touch any exposed parts or connections during operation.

Use the supplied touch proof connector cables.

1. Switch off the voltage at the voltage source and check that no voltages are present.
2. Connect the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
3. Switch on the ALMEMO® measuring device.
4. Using the connecting cables, connect the voltage source to the black sockets of the measuring module.



Measuring Signal Connector Cables Measuring Module for Voltage

5. Switch on the voltage at the voltage source.

➢ The measured values will be displayed on the ALMEMO® measuring device.

5.5 How to measure Current AC with the Module ZED7 31-ABy

The device internal current measurement path is not intended for continuous operation for currents greater than 10A. In that case, the measurement can only be run for a maximum of 10 minutes. After this period of time, the device must be cooled down to ambient temperature.

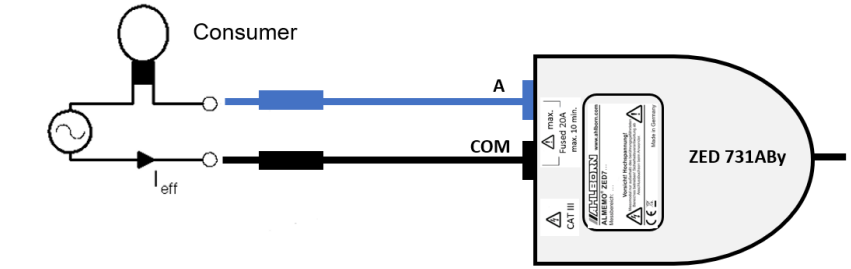
Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

To avoid electric shocks, do not touch any exposed parts or connections during operation.

Use the supplied touch proof connector cables.

With no consumer present do not connect the current measurement module directly to the voltage source. Possible resulting risks are overheating or destruction of the module.

1. Connect a consumer to the current source.
2. Switch off the consumer to make sure that no current flows and check that no voltages are present.
3. Insert the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
4. Switch on the ALMEMO® measuring device.
5. Integrate the measuring module in the current path of the consumer.



6. Switch on the consumer.

➢ The measured values will be displayed on the ALMEMO® measuring device.

5.6 How to measure Power AC with the Module ZED7 37-ABxy

The device internal current measurement path is not intended for continuous operation for currents greater than 10A. In that case, the measurement can only be run for a maximum of 10 minutes. After this period of time, the device must be cooled down to ambient temperature.

Cable the system (especially for measuring voltages greater than 50V) in power-off state. Only switch on the voltage after the cabling has been set up completely.

To avoid electric shocks, do not touch any exposed parts or connections during operation.

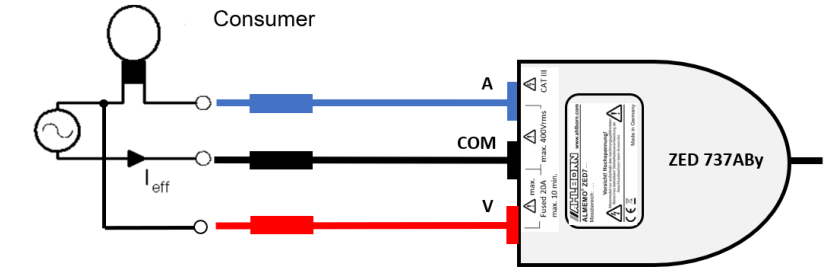
Use the supplied touch proof connector cables.

With no consumer present do not connect the current measurement module directly to the voltage source. Possible resulting risks are overheating or destruction of the module.

☞ Voltage and current are measured synchronously and on the basis of those two the active power will be calculated. Furthermore, the frequency will be measured and the phase shift will be calculated.

1. Connect a consumer to the current source.
2. Switch off the consumer to make sure that no current flows and check that no voltages are present.
3. Connect the ALMEMO® plug of the measuring module to an ALMEMO® input socket of the ALMEMO® measuring device.
4. Switch on the ALMEMO® measuring device.
5. Integrate the measuring module in the measuring path of the consumer via the blue connecting cable (into socket A).

6. Connect the black connecting cable to the black socket (COM) of the measuring module and directly to the voltage source. It should be noted that the black socket (COM) represents the ground potential of the measuring module.
7. Using the red connecting cable, connect the red socket (V) directly to the voltage source.



Measuring Signal Connector Cables Measuring Module for Power

8. Switch on the consumer.

➢ The measured values will be displayed on the ALMEMO® measuring device.

6 Use socket adapter

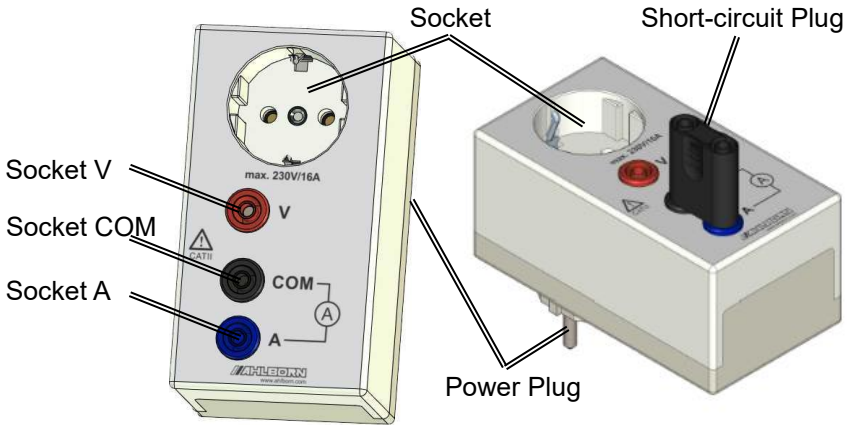
When installing the mains adapter, note that it must be possible to disconnect it from the mains quickly at any time.

Wire (especially for measuring voltages above 50V) in a voltage-free condition.

Do not touch exposed parts or connections during operation to avoid electric shocks.

Use the supplied touch-protected connection cables.

Pay special attention that the current modules are always connected in series to the consumer, i.e. in a supply line, and must not be connected directly to the voltage source. When using the socket adapter, the corresponding sockets of the socket adapter and measuring module (A-A, V-V, COM-COM) must be connected to each other. The color of the sockets must be observed here.



6.1 Voltage measurement with socket adapter

1. Plug the short-circuit plug into sockets A and COM of the socket adapter.
2. Connect the red connection cable to the red socket (V) of the measuring module and the red socket (V) of the socket adapter.

3. Connect the black connection cable to the black socket (COM) of the measuring module and the socket of the short-circuit plug, which is plugged on the socket COM of the socket adapter.
4. Plug the mains plug of the socket adapter into a mains socket and the mains plug of the consumer into the socket of the socket adapter.
5. Follow the instructions in chapter 5.1 Measure voltage DC with the ZED7 00-ABx module or in chapter 5.4 Measure voltage AC with the ZED7 30-ABx module.

6.2 Current measurement with socket adapter

☞ The short-circuit plug is not required.

1. Connect the blue connection cable to the blue socket (A) of the measuring module and the blue socket (A) of the socket adapter.
2. Connect the black connection cable to the black socket (COM) of the measuring module and the black socket (COM) of the socket adapter.
3. Plug the mains plug of the socket adapter into a mains socket and the mains plug of the consumer into the socket of the socket adapter.
4. Follow the instructions in chapter 5.2 Measuring the DC current with the ZED7 01-ABx module or in chapter 5.5 Measuring the AC current with the ZED7 31-ABx module.

6.3 Power measurement with socket adapter

☞ The short-circuit plug is not required.

1. Connect the blue connection cable to the blue socket (A) of the measuring module and the blue socket (A) of the socket adapter.
2. Connect the black connection cable to the black socket (COM) of the measuring module and the black socket (COM) of the socket adapter.
3. Connect the red connection cable to the red socket (V) of the measuring module and the red socket (V) of the socket adapter.

4. Plug the mains plug of the socket adapter into a mains socket and the mains plug of the consumer into the socket of the socket adapter.
5. Follow the instructions in chapter 5.3 Measuring DC power with the ZED7 07-ABx module or in chapter 5.6 Measuring AC power with the ZED7 37-ABx module.

7 Maintenance and Care

How to clean the housing

The devices must not be opened by the user.

The devices must be disconnected from the power supply.

→ If soiled, clean the housing with a damp cloth without any detergents.

How to maintain and repair the device

Repair and maintenance work may only be carried out by the Ahlborn Company.

→ In case of necessary repair or maintenance work, please send the device resp. the devices to the Service department of the Ahlborn Company.

8 Warranty

Before leaving the factory, every device has passed several quality tests. For proper functioning, a 2 year warranty is granted beginning with the day of delivery. In case of a defect, please use – if possible – the original packing material and attach a precise description of the defect as well as of the corresponding boundary conditions.

The following cases are excluded from warranty:

- Unauthorized interventions and changes within the device performed by the customer
- Operation outside the indicated environmental conditions applicable for this product
- Use of improper power supply and peripheral devices
- Improper use of the device
- Disregard of the Instruction Manual

We reserve the right to make changes in product features in favor of technical progress or due to new construction elements.

9 Disposal

The symbol of a crossed-out waste bin implies that the product must be disposed off separately in the European Union.
This applies to the product itself as well as to all accessory components labeled with this symbol. The products must not be discarded via the unsorted municipal waste.

→ Dispose of defect rechargeable batteries / empty batteries in accordance with the legal requirements.

→ When no longer in use, the product must be disposed of at the collecting point specified for electrical and electronic equipment. In doing so, please observe the local disposal regulations.

→ Dispose of the packing material in accordance with local regulations.

10 Technical Data

Measuring module

Input sockets	Safety sockets CAT III, 20 A, Ø 4 mm	
Galvanic isolation	6 kV	
Sampling rate	1 KHz internal	
Accuracy	0.1% of final value. ± 2 Digit, valid for currents ≤ 10 A	
Temperature drift	max. 0.003 %/K (30 ppm/K), valid for currents ≤ 10 A	
Nominal conditions	23 °C ± 2 K, 10 to 90% RH (non-condensing)	
Operating conditions Operating temperature Ambient humidity Maximum altitude above sea level	 +5 to +40 °C 10 to 90% RH 2000 m	 (storage temp.: -20 to +60 °C) (non-condensing)
Input resistance R_I		
Voltage measurement current measurement	25/60 V 400 V 20 mA / 200 mA 2 A / 20 A	1 x 10^6 Ohm 4 x 10^6 Ohm 4,7 Ω / 1 Ω 100 mΩ / 8 mΩ
Measuring period of current measurement	For currents greater than 10A maximum a of 10 minutes. After this period the device must be cooled down to ambient temperature.	
Housing	ABS, Dimensions 127 x 83 x 42 mm (LxWxH)	
Operating voltage	9 to 12 V via ALMEMO® device	
Nominal current	max. 60 mA (plug and module)	
AC measurement		
Operating range U, I, P	DC to 250 Hz	
Power factor cosφ	0.17 to 1 (corresponds to φ: -80° to 80°)	
Response threshold U, I	signal U and I > 1 % of final value.	
Settling time	4 periods (maximum of 200 ms, e.g. at 50 Hz: 80 ms)	
Measuring range frequency	20 to 250 Hz	
Measuring ranges voltage, current, power (DC/AC)	See chapter 4.3	

Subject to technical modifications without prior notice!

Socket adapter

Input sockets/ short-circuit plug	Safety sockets CAT II, 16 A, Ø 4 mm 230 V, 16 A, 50 Hz	
Nominal conditions	23 °C ± 2 K, 10 … 90% r.H. (non-condensing)	
Operating conditions Operating temperature Ambient humidity Max. height over sea level	 +5 … +40 °C 10 … 90% r.H. 2000 m	 (Storage temperature: -20..+60 °C) (non-condensing)
Housing	ABS, Dimensions: L120 x B65 x H94 mm	

Subject to technical changes!

You will find the present and further Instruction Manuals, as well as the ALMEMO® Manual on **www.ahlborn.com** under the tab SERVICE on DOWNLOADS.

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