2. ALMEMO® Measuring Instruments

Although the processing of measured values and the functions of all ALMEMO® measuring instruments are identical, there is a large number of different versions for all applications. The standard versions are listed below.

Hand-held Instruments:
2390-1 1 input, 2 channels, analog output, without interface
2390-3 2 inputs, differential max / min and hold, with interface
2390-5 3 inputs, all functions accessible via keyboard
        Option data logger with external memory connector
2690-8 5 inputs, data logger, sleep mode, graphic display
2890-9 9 inputs, data logger, sleep mode, graphic display

Table Instruments:
3290-8 Data logger, 9 inputs, 6 keys, function switches
8590-9 Transmitter / data logger, 9 inputs, 1 key, without display
8990-6 Digital transmitter, 9 inputs, 2keys, no display
8990-8 Data logger, 9 inputs, 3 keys, no display
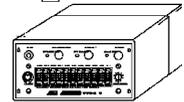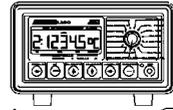
Data Acquisition Systems:
5990-0 System with 1 measuring module (9 inputs), selector
        switch boards (max. 89 inputs), optional memory
5990-1 System with bus-networked measuring modules,
        selector switch boards (max. 190 inputs),
        optional memory and rechargeable battery
5990-2 System with keyboard, memory, and graphics display,
        10 inputs, expandable with selector switch boards
        (max. 90 inputs), optional rechargeable battery
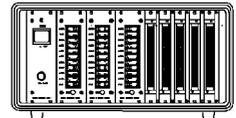
Switchboard and Switch Cabinet Instruments:
4490-2 Switchboard instrument with 6-digit LED display, 1 input, 4 keys
        option alarm relay and electrically isolated analog output
8390-1 Transmitter, 1 input, interface, mains adapter
8390-2 ditto plus display and 5 keys (functions as on 2390-5)
        Option RS485, electrically isolated analog output, 24-volt supply

Measuring Instruments with Built-In Printer:
6290-7 2 inputs, 6 keys, display and built-in thermoprinter, list printout,
        graphic recording, power supply by rechargeable battery,
        option memory
6290-7K Climate printer and plotter for temperature and humidity
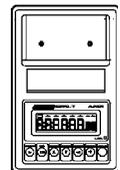
The following table provides a detailed list of the features and functions of individual instruments.

ALMEMO®- Meas. Instruments

Equipment:	V6 2390				V6 2690	V6 2890	V5 5990			V5 4490	V6 8390		V6 8590	V5 8990	
	-1	-3	-5	-8	-8	-9	0	-1	-2	-2	-1	-2	-9	-6	-8
Sensor inputs, at maximum	1	2	3	5	5	9	89	190	90	1	1	1	9	9	9
Channels per input	2	4	4	4	4	4	1-4	1-4	1-4	4	4	4	4	1-4	1-4
Measuring channels, at maximum	2	12	16	24	24	40	99	370	100	4	4	4	40	36	36
Output sockets	1	1	2	2	2	2	2	3	3	2	1	1	2	2	2
Connector for analog output, trigger, relay	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Connector for serial interface, network	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Display digits C=LCD, G=Graphic LCD or L=LED	8C	8C	8C	8C	336G	336G	-	-	336G	4L	-	8C	-	-	-
Display lighting F=film, L=LED	-	-	-	-	L	L	-	-	F	-	-	-	-	-	-
Function selector with 16 switch positions	-	5	5	5	9S	9SB	-	-	7S	4	-	5	1	2	3
Function keys (S=soft keys, B=operat. dial)	-	-	-	-	•	•	-	-	•	-	-	-	-	-	-
Meas. and programming menus	-	-	•	•	•	•	O	O	•	-	-	-	•	-	•
Real-time clock with date function	-	-	O	•	-	-	-	-	-	-	-	-	-	-	-
Storage up to 32kB on EEPROM	-	-	-	•	•	•	O	0/0	•/O	-	-	-	O	-	•/O
Data storage 256kB in ext. ALMEMO connection	-	-	Z	Z	-	-	-	-	-	-	-	-	-	-	O
Storage on external memory-card	-	-	-	-	Z	Z	-	-	◆	-	-	-	Z	-	-
Sleep mode for long-term recording	-	-	•	•	•	•	-	-	-	-	-	-	•	-	O
Power supply B=battery, N=mains/adapter	B	B	B	B	B	N	N	N	N	N	N	N	N	N	N
Pow. supply recharg. battery with quick charge	-	-	-	-	Z	•	-	O	O	-	-	-	-	-	O
Power supply 9-36VDC electrically isolated	Z	Z	Z	Z	Z	Z	O	O	O	O	O	O	Z	Z	O
Sensor/battery voltage monitoring	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Functions Sensor Parameters:															
Measuring range	o	V	◆	◆	◆	◆	V	V	◆	◆	V	◆	V	V	V
Function channels (max, min, aver., diff., sum)	o	V	◆	◆	◆	◆	V	V	◆	◆	V	◆	V	V	V
Reference channels, programmable	-	V	V	V	◆	◆	V	V	◆	V	V	V	V	V	V
Dimension, 2 characters	o	V	◆	◆	◆	◆	V	V	◆	◆	V	◆	V	V	V
Measuring channel name, 10 characters	o	V	V	V	◆	◆	V	V	◆	V	V	V	V	V	V
Time constant for smoothing of meas. values	-	-	◆	◆	◆	◆	-	-	◆	-	V	◆	◆	-	-
Averaging mode (manual start/stop,single)	-	-	◆	◆	◆	◆	-	-	◆	-	V	◆	◆	-	-
Averaging mode (continuously, cyclic)	-	-	◆	◆	◆	◆	V	V	◆	V	V	V	◆	V	V
Input of cross section or diameter	-	-	◆	◆	◆	◆	-	-	◆	-	V	◆	V	-	-
Limit value max and min	-	V	◆	◆	◆	◆	V	V	◆	◆	V	V	V	V	V
Hysteresis for alarm, programmable	-	V	V	V	◆	◆	V	V	◆	◆	V	V	V	V	V
Assignment of alarm relay to limit values	-	-	V	V	◆	◆	V	V	◆	V	V	V	V	V	V
Zero point and gain correction	o	V	◆	◆	◆	◆	V	V	◆	◆	V	V	V	V	V
Ambient temperature and emission factor	o	V	F	F	F	F	V	V	F	F	V	F	V	V	V
Basic value, factor and exponent	o	V	◆	◆	◆	◆	V	V	◆	◆	V	V	V	V	V
Scaling of analog output (start, end)	o	V	◆	◆	◆	◆	V	V	◆	◆	V	◆	V	V	V
Minimum sensor voltage, programmable	o	V	V	V	◆	◆	V	V	◆	V	V	V	V	V	V
Locking function for sensor programming	-	V	◆	◆	◆	◆	V	V	◆	◆	V	◆	V	V	V

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ALMEMO®- Meas. Instruments

Measuring Functions:	V6 2390 -1	-3	-5	-8	V6 2690 -8	V6 2890 -9	V5 5990 0	-1	-2	V5 4490 -2	V6 8390 -1	-2	V6 8590 -9	V5 8990 -6	-8
Measured value	♦	♦	♦	♦	♦	♦	V	V	♦	♦	V	♦	V	V	V
Bar and line diagram	-	-	-	-	♦	♦	-	-	♦	-	-	-	-	-	-
Differential measuring, continuous	-	♦	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Maximum and minimum value	♦	♦	♦	♦	♦	♦	V	V	♦	♦	V	♦	V	V	V
Time, date of maximum and minimum value	-	-	-	-	♦	♦	-	-	♦	-	-	-	V	-	-
Momentary value memory (hold function)	-	♦	-	-	-	-	-	-	-	-	-	-	-	-	-
Average value, Number of averaged values	-	-	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Volume flow rate (avg. value x cross section)	-	-	♦	♦	♦	♦	-	-	♦	-	V	♦	V	-	-
Atm. pressure compensat. (psychrometer, O_2)	-	V	♦	♦	♦	♦	V	V	♦	F	V	♦	V	V	V
Cold junct. compensation intern./extern., fixed	I	I	I/E	I/E	I/E	I/E	I/E	I/E	I/E	I	I/E	I/E	I/E	I/E	I/E
Temp. compens. (rH/pH/cond./dyn.press./O_2)	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Sensor adjustment	-	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Enter the setpoint	-	-	♦	♦	♦	♦	-	-	♦	-	-	♦	V	-	-
Linearization, multi-point correction in the connector	-	-	♦	♦	♦	♦	-	-	-	-	-	-	♦	-	-
Functions / Instrument Parameters:															
Instrument description 40 characters	-	V	V	V	♦	♦	V	V	♦	V	V	V	V	V	V
Key lock	-	-	-	-	♦	♦	-	-	♦	-	-	-	-	-	V
Language selection	-	-	♦	♦	♦	♦	-	-	♦	-	-	♦	-	-	-
Conversion rate 2.5 or 10 M/s Option 50 M/s	-	-	V/-	V/-	♦/♦	♦/♦	V/0	V/0	♦/♦	V/-	V/-	V/-	V/V	V/0	V/0
Continuous scanning with output 0.10s	-	-	V	V	♦	♦	V	V	♦	V	V	V	V	V	V
Time and date	-	V	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Measuring cycle and print cycle	-	♦	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Baud rate, device address	-	V	♦	♦	♦	♦	V	V	♦	♦	V	♦	V	V	V
Output format list, column, table/spreadsheet	-	V	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Single scan and output	-	V	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	V
Cyclic scan and output	-	-	♦	♦	♦	♦	V	V	♦	V	V	♦	V	V	♦
Cyclic scan and output of offnormal values	-	-	-	-	-	-	V	V	♦	V	-	-	-	V	V
Measurement numbering	-	-	O	O	♦	♦	-	-	♦	-	-	-	V	-	V
Output of a number list	-	-	O	O	V	V	-	-	V	-	-	-	V	-	V
Start/stop by time and date	-	-	O	O	♦	♦	O	O	♦	-	-	-	V	-	V
Start/stop by limit value, maximum or minimum	-	-	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦	♦
Memory for measured values, free memory	-	-	O	O	♦	♦	O	O	♦	-	-	-	O	-	V
Continuous saving with 0.10s	-	-	O	O	♦	♦	O	O	♦	-	-	-	O	-	V
Selective memory access, start/end/time/date	-	-	O	O	♦	♦	O	O	♦	-	-	-	O	-	V
Output relay control via interface	-	-	V	V	♦	♦	V	V	♦	V	-	-	V	V	V

♦   Function is available as standard and is possibly programmable
o   Programmed value will be considered, but cannot be programmed
F   Function will be activated by corresponding sensors
A   Function can be activated via keyboard or interface
V   Function only accessible or programmable via serial interface
O   Function optionally available
Z   Function available as accessory

2.1 Measuring Ranges

Type of Sensor	Model	Meas. Range	Dim.	Resol.	Accuracy Linearisation
Resistor-based Temperature Sensors:					
Pt100/PT1000-1 4-conductor	FP Axxx	-200.0 ... +850.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
Pt100/PT1000-2 4-conductor	FP Axxx	-200.00 ... +400.00	°C	0.01 K	± 0.05 K
Pt100-3 4-conductor	FP Axxx	0.000 ... +65.000*	°C	0.001 K	± 0.005 K
Ni100/Ni1000 4-conductor		-60.0 ... +240.0	°C	0.1 K	± 0.05 K
Ntc Typ N	FN Axxx	-50.00 ... +125.00	°C	0.01 K	± 0.05 K
Thermocouples:					
NiCr-Ni (K)	FT Axxx	-200.0 ... +1370.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
NiCroSil-Nisil (N)		-200.0 ... +1300.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
Fe-CuNi (L)		-200.0 ... +900.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
Fe-CuNi (J)		-200.0 ... +1000.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
Cu-CuNi (U)		-200.0 ... +600.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
Cu-CuNi (T)		-200.0 ... +400.0	°C	0.1 K	± 0.05 K ± 0.05 % of m.v.
PtRh10-Pt (S)		0.0 ... +1760.0	°C	0.1 K	± 0.3 K
PtRh13-Pt (R)		0.0 ... +1760.0	°C	0.1 K	± 0.3 K
PtRh30-PtRh6 (B)		+400.0 ... +1800.0	°C	0.1 K	± 0.3 K
AuFe-Cr		-270.0 ... +60.0	°C	0.1 K	± 0.1 K
Electrical Signals:					
Millivolt DC		-10.0 ... +55.0	mV	1 uV	-
Millivolt 1 DC		-26.0 ... +26.0	mV	1 uV	-
Millivolt 2 DC		-260.0 ... +260.0	mV	0.01 mV	-
Volt DC		-2.6 ... +2.6	V	0.1 mV	-
Volt DC		-26,0 ... +26,0	V	1 mV	-
Diff. Millivolt DC		-10.0 ... +55.0	mV	1 uV	-
Diff. Millivolt1 DC		-26.0 ... +26.0	mV	1 uV	-
Diff. Millivolt2 DC		-260.0 ... +260.0	mV	0.01 mV	-
Diff. Volt DC		-2.6 ... +2.6	V	0.1 mV	-
Milliampere DC		-32.0 ... +32.0	mA	1 uA	-
Percent (4-20mA DC)		0.0 ... 100.0	%	0.01 %	-
Ohm 1		0.00 ... 500.00	Ω	0.01 Ω	-
Ohm 2		0.00 ... 5000.0	Ω	0.1 Ω	-
Frequency	ZA 9909-AK1	0 ... 15000	Hz	1 Hz	-
Pulses / meas. cycle	ZA 9909-AK2	0 ... 65000			-
Speed	ZA 9909-AK4	8 ... 32000	rpm	rpm	-
Digital input	ZA 9000-ES2	0.00 ... 100.00	%		-
Infrared Sensors:					
Infrared 1	FI A628-1/5	0.0 ... +200.0	°C	0.1 K	±0.05 K ± 0.05 % of m.v.
Infrared 2	FI A628-2	0.0 ... +800.0	°C	0.1 K	± 0.4 K
Infrared 3	FI A628-3	-30.0 ... +70.0	°C	0.1 K	± 0.05 K
Infrared 4	FI A628-4	-30.0 ... +100.0	°C	0.1 K	± 0.05 K .
Infrared 6	FI A628-6	0.0 ... +500.0	°C	0.1 K	± 0.1 K ± 0.05 % of m.v.

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Type of Sensor	Model	Meas. Range		Dim.	Resol.	Accuracy Linearisation
Cap. Humid. Sensors:						
Rel. humidity	FH A646	5.0 ...	98.0	%H	0.1 %	-
Rel. humidity with TC	FH A646-R/C	5.0 ...	98.0	%H	0.1 %	± 0.5 %
Dew point temperature	FH A646	-25.0 ...	100.0	°C	0.1 K	± 0.2 K
Mixture ratio, PC	FH A646	0.0 ...	500.0	g/kg	0.1 g/kg	± 0.5 % of m.v.
Partial vapour pressure	FH A646	0.0 ...	1013.2	mbar	0.1 mbar	±0.1mbar ± 0.1% of m.v.
Enthalpy with PC	FH A646	0.0 ...	400.0	kJ/kg	0.1 kJ/kg	± 0.5 % of m.v.
Psychrometers:						
Humid temperature	FN A846	0.00 ...	+100.00	°C	0.01 K	± 0.05 K
Rel. humidity with PC	FN A846	0.0 ...	100.0	%H	0.1 %	± 1.0 %H
Dew point temperature,PC	FN A846	-25.0 ...	100.0	°C	0.1 K	± 0.2 K
Mixture ratio with PC	FN A846	0.0 ...	500.0	g/kg	0.1 g/kg	± 0.5 % of m.v.
Partial vapour pressure,PC	FN A846	0.0 ...	1013.2	mbar	0.1 mbar	±0.1mbar ± 0.1% of m.v.
Enthalpy with PC	FN A846	0.0 ...	400.0	kJ/kg	0.1 kJ/kg	± 0.5 % of m.v.
Flow Sensors:						
Rotating vane, normal	FV A915-S120	0.30 ...	20.00	m/s	0.01 m/s	± 0.1 m/s ± 0.2 % of m.v.
Rotating vane, normal	FV A915-S140	0.40 ...	40.00	m/s	0.01 m/s	± 0.2 m/s ± 0.2 % of m.v.
Rotating vane, micro	FV A915-S220	0.50 ...	20.00	m/s	0.01 m/s	± 0.1 m/s ± 0.2 % of m.v.
Rotating vane, micro	FV A915-S240	0.60 ...	40.00	m/s	0.01 m/s	± 0.2 m/s ± 0.2 % of m.v.
Rotating vane, macro	FV A915-SMA1	0.10 ...	20.00	m/s	0.01 m/s	± 0.1 m/s ± 0.2 % of m.v.
Water turbine	FV A915-WM1	0.00 ...	5.00	m/s	0.01 m/s	± 0.1 m/s ± 0.2 % of m.v.
Dyn. press. sens.TC, PC	FD A602M1K	0.5 ...	40.0	m/s	0.1 m/s	± 0.1 m/s
Dyn. press. sens. TC, PC	FD A602M6	1.8 ...	90.0	m/s	0.1 m/s	± 0.1 m/s
Chemical Probes:						
Conductivity probe, TC	FY A641-LF/2/3	0.0 ...	20.000	mS	0.001 mS	± 0.2 % of m.v.
CO_2 probe	FY A600-CO2	0.0 ...	25.00	%	0.01 %	± 0.2 % of m.v.
O_2 saturation, TC, PC	FY A640-O2	0 ...	260	%	1 %	-
O_2 concentration, TC	FY A640-O2	0.0 ...	40.0	mg/l	0.1 mg/l	± 0.2 mg/l
Function Values:						
Difference						-
Maximum value						-
Minimum value						-
Aver. value over time						-
Aver. val. over junctions						-
Sum over junctions		0 ...	65000			-
Total number of pulses	ZA 9909-AK2	0 ...	65000			-
Pulses/print cycle	ZA 9909-AK2	0 ...	65000			-
Alarm value		0.0 ...	100.00	%		-
Thermal coefficient	M (q) / M (ΔT)					-
Wet bulb globe temp.	(0.1TT+0.7HT+0.2GT)					-
Digital interface	ZA 9919-AKxx	0 ...	65000			-

Type of Sensor	Model	Meas. Range		Dim.	Resol.	Accuracy Linearisation
Battery voltage*		0,00 ...	20.00	V	0.01V	
Measured value*						
Cold junction temperature*		-30.00 ...	+100.00	°C	0.01K	± 0.05 K
Number of averaged val.*		0 ...	65000		1	
Volume flow*		0 ...	65000	m³/h	1 m³/h	
Timer*		0 ...	60000	s	1 s	-

* The measuring range available depends on the device type and version; in some cases different data is available; (see device instructions). TC = with temperature compensation, PC = with atmospheric pressure compensation

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2.2 Special Measuring Ranges

Type of Sensor	V5 Option	V6 Connector*	Meas. Range		Dim	Resol.	Accuracy Linearisation
Resistor-based Temperature Sensor							
NTC type N FNA xxx	SB0000 N3	ZA9040SS3	0.000...	+45.000	°C	0.001 K	± 0.005 K
KTY 84	SB0000 K	ZA9040SS4	-40.0...	+200.0	°C	0.1 K	± 0.1 K
YSI 400	SB0000 Y	ZA9641SS	-40.0...	+130.0	°C	0.01 K	0..50°C:± 0.05K;other:±0.1K
50 Ohm	-	ZA9003SS3	0.000...	50.000	Ω	0.001Ω	-
Thermocouples							
W5Re-W26Re (C)	SB0000W5	ZA9000SSC	0.0...	+2320.0	°C	0.1 K	± 0.25 K
NiCr-Ni (K)	SB0000 N2	ZA9020SS2	-100.0...	+500.00	°C	0.01 K	± 0.025 K
Flow sensors							
Temperature sensor SS20	SB0000 S	ZA9602SSS	0.50...	+20.00	m/s	0.01 m/s	± 0.02 m/s
Temp. Measuring Range for Refrigerants							
Only with device option SB0000 R* :							
R22 (0...36 bar$_{absolute}$)			-90.0...	+79.0	°C	0.1 K	<-24°C:± 0.2K;>-24°C:±0.1K
R23 (0...49 bar$_{absolute}$)			-100.0...	+26.0	°C	0.1 K	<-24°C:± 0.2K;>-24°C:±0.1K
R134a (0...40 bar$_{absolute}$)			-75.0...	+101.0	°C	0.1 K	<-16°C:± 0.2K;>-16°C:±0.1K
R404a (0...32 bar$_{absolute}$)			-60.0...	+65.0	°C	0.1 K	± 0.1 K
R407c (0... 46 bar$_{absolute}$)			-50.0...	+86.0	°C	0.1 K	<-30°C:± 0.2K;>-30°C:±0.1K
R410 (0... 49 bar$_{absolute}$)			-70.0...	+70.0	°C	0.1 K	<-30°C:± 0.2K;>-30°C:±0.1K
R417a (0... 27 bar$_{absoluet}$)			-50.0...	+70.0	°C	0.1 K	<-35°C:± 0.2K;>-35°C:±0.1K
R507 (0... 37 bar$_{absolute}$)			-70.0...	+70.0	°C	0.1 K	<-30°C:± 0.2K;>-30°C:±0.1K

* not for devices 2390-1, -3 and 8390-1, -2

2.3 Technical Data

Inputs:

Channel switchover	4-contact, with photo-MOS relay, offset voltage <5 mV
between input connectors:	potential separation: at max. 50V
	Meas. modules with higher potential separation see 4.2.8
Sensor voltage supply:	7.2V ... 12V depend. on power supply, at max.
Self-calibration:	automatic zero point correction, measur. current
Nominal temperature:	22°C ± 2K
Cold junction compensation:	-30 ... +100°C accuracy: ± 0.2K ± 0.01K/°C
Check functions:	automatic sensor and sensor breakage detection

A/D converter

V5 devices without Q2 option : Multi-slope integrating, 16-bit resolution

Measuring current	Pt100 approx. 1 mA ; Pt1000 approx. 0.1 mA
Common-mode input range	-4 to +4 V, Overload max. ±5 V
Input current	<50 nA
Measuring rate	2.5 or 10 measuring operations per second
System accuracy	±0.03 % of meas. value ±2 digits (at 2.5 measuring / second)
Temperature drift	0.005 % / °C

V6 devices 2390-x, 8390-x delta-sigma, 16-bit resolution

Measuring current	Pt100, Pt1000 0.3 mA
Common-mode input range	-2 to +5 V, Overload max. -2 to +5 V
Input current	<20 nA
Measuring rate	2.5 or 10 measuring operations per second
System accuracy	±0.03 % of meas. value ±2 digits (at 2.5 meas. op / second)
Temperature drift	0.005 % / °C

V6 devices 2690-8, 2890-9, V5 devices 2590-8, 5990-2, option Q2

A/D converter	delta-sigma, 24-bit resolution
Measuring current	Pt100 approx. 1 mA ; Pt1000 approx. 0.1 mA
Common-mode input range	-3.0 to +3.0 V in DC voltage range (2.6 V)
	–2.0 to +1.7 V in all other measuring ranges
Overload	max. ±12 V
Input current	500 nA in DC voltage range (2.6 V)
	500 pA in all other measuring ranges
Measuring rate	2.5 / 10 / 50 measuring operations per second
System accuracy	0.02% ±1 digit (at 2.5 and 10 meas. op / second)
	0.05% ±3 digits (at 50 measuring operations per second)
Temperature drift	0.003 % / °C
Functional restrictions affecting	analog output, connector scan, sensor breakage detection,
50 meas. op / second	Alarm value printout and mains hum suppression are not possible.

☞ If the absence of mains hum suppression causes a measured value to become unsteady, this can be prevented by using twisted sensor lines.

Important note

The input current in the DC voltage range (2.6 volts) causes an error (maximum 0.4%) on the 10/1 divider connector (ZA 9602-FS).

This can be remedied by using a new 100/1 divider connector (ZA 9602-FS/H) with a measuring range of 260 mV.

To measure strain gauges and force transducers in a bridge circuit, use a connector (ZA 9650-FSx) with differential amplifier.

Outputs:

ALMEMO® output socket A1

digital interface:	baud rates: 300, 600, 1200, 2400, 4800, 9600, 57.6k, 115.2k
	data 8 bit serial, 1 start bit, 1 stop bit, no parity
	RS232 with data cable ZA 1909-DK5
	Optic fiber with data cable ZA 1909-DKL
	RS422 with network branch module ZA 5099-NVB/NVL
	USB with adapter cable ZB1909-USB
	Ethernet with adapter cable ZB1945-DK
	Wireless with Bluetooth modules ZA1709BTxDK
analog output:	-1.25...2.0V with analog output cable ZA 1601-RK

ALMEMO® output socket A2

data storage	ALMEMO® storage connector 128/256kB ZA 1904-SS
	ALMEMO® memory connector for multi-media card
networking:	current loop with network cable ZA 1999-NK5
analog output:	-1.2...2.0V not elec. isol. w. analog outp. cable ZA 1601-RK
	-6...10V, 0/4...20mA elec. isol. w. adapter ZA 8000-RTA
	resolution: 32 000 Digit
	accuracy: ± 0,1% ± 6 digits, drift 1digit/K
trigger input:	with trigger cable ZA 1000-ET/EK/EAK, ZA 8000-RTA
relay output:	with relay cable ZA 1000-EGK/EAK, ZA 8000-RTA

Instrument:

Interface to all

ALMEMO® connectors/modules:	I²C Bus
Operating temperature	-10 to +60°C
Storage temperature:	-30 to +60°C
Humidity:	10 to 90% (non-condensing)
Electromagnetic compatibility (EMC)	IEC 61 326, IEC 61 000-6-1, IEC 61 000-6-3,
	IEC 61 000 -4 -2, IEC 61 000-4 -3, IEC 61 000 -4 -4

Power Supply Adapters:

ZB 2290-NA for small handheld devices	12 VDC, 0.2 A, coaxial connector
ZB 2590-NA for 2590-9, 2890-9	12 VDC, 0.8 A, coaxial connector
ZA 2690-NA for 2690-8:	12 VDC, 0.6 A, ALMEMO connector
ZB 3090-NA for desktop devices	12 VDC, 0.2 A, 3-pin miniature connector with bayonet fitting
ZB 5090-NA2 As above but with rechargeable battery	12 VDC, 0.8 A, 3-pin miniature connector with bayonet fitting
ZB 5090-NA3 for Data aquisition systems	12 VDC, 2.1 A, 3-pin miniature connector with bayonet fitting
Extension cable ZB5090VK05 :	5 m for 3-pin miniature plug with bayonet coupling

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