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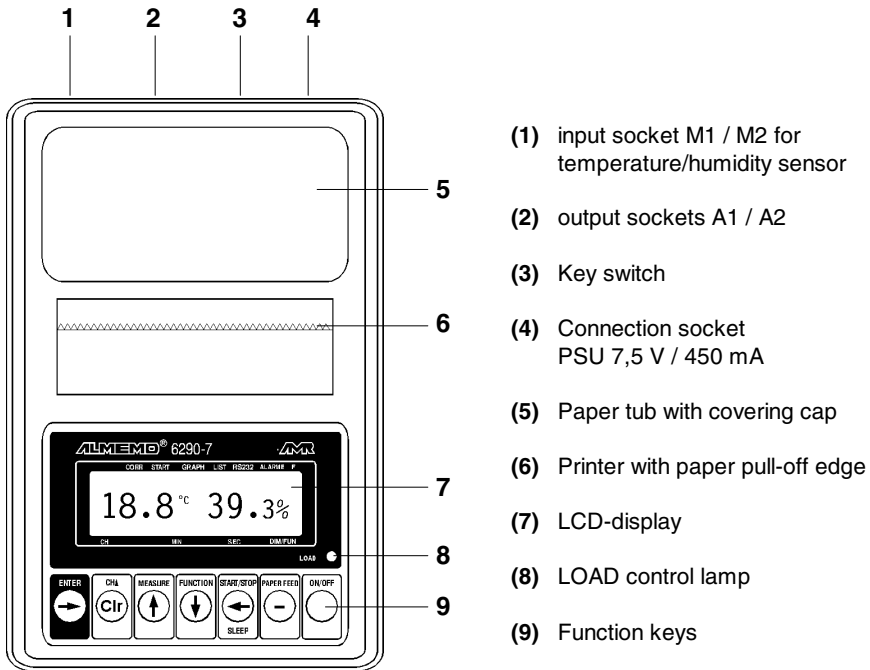
Technical data:

Measuring inputs:	1 ALMEMO-socket, 2 channels for temperature and humidity
Measuring ranges:	temperature Ntc-sensor (type N) FN Axxx -50.00...+125.00 °C
	rel. humidity capacitive sensor FH A646 5.0 ... 98.0 %H
	rel. humidity psychrometer FN A846 0.0 ... 100.0 %H
Sensor power supply:	approx. 9V unregulated, 80mA in total
AD-converter:	multi Slope integrating, 16 bit resolution, 3 measurements/s
Self calibration:	automatic zero point correction
System accuracy:	± 0.05 % of measured value, ± 2 Digit
Temperature drift:	0.005 %/°C (nominal temperature: 22 °C ± 2 K)
Check functions:	automatic sensor and interface recognition
Display:	6x7 segment, 2x16 segment LCD, height 13mm
Built-in thermo-printer:	40 characters/line (alphanumeric), 8x280 dots/line (graphic)
Printing cycle:	4 sec. up to 12 hours (in Sleep mode: 1 min. up to 12 hours)
Paper feed:	0.01 to 320 mm/h
Time and date:	real-time clock buffered with Lithium battery
Memory (option S):	512 kByte (100 000 measured values) buffered with Lithium battery
Outputs:	1 ALMEMO-socket for interfaces and alarm cable ZA 1000-GK
	serial interface with ALMEMO-output-module ZA 1909-DK
	data 8 bit ASCII Code, 1 startbit, 1 stopbit, no parity
	baud rates: 150, 300, 600, 1200, 2400, 4800, 9600
Power supply:	4 built-in NiCd-batteries (900 mAh) with boost charge circuit
Current consumption:	OFF: approx. 0.04mA,
	ON without printout: approx. 11mA, ON with printout approx. 500mA
Power supply control:	automatic at 4.5V with optical alarm
Charger:	mains adapter 7.5 V, 450 mA, charging time: 4h
Housing:	synthetic material (180 x 115 x 70 mm)
Operating temperature:	0 ... +40 °C (storage temperature: -10 ... +60 °C)
Electromagnetic compatibility:	EN 50081-1
	EN 50082-1: IEC 801-2 8kV, IEC 801-4 1kV, IEC 801-3 3V/m <50uV

1. Functions

With the climate printer ALMEMO 6290-7K the measured values of capacitive or psychrometric temperature/humidity sensors can be plotted alphanumerically as a list or as a line graphic. With the option S (memory) the measured values can be stored and output in any form. When the instruments is operated in the Sleep mode by means of the built-in accus also mains-independant longterm-measurements are possible. If a serial interface cable is connected, programming and data evaluation is possible by means of a computer.

2. Operating controls



3. Connecting sensors

One of the following sensors can be connected to input socket M1/M2 (1) :

- Compact capacitive temperature/humidity sensor FH A646-6
- Capacitive hand-held temperature/humidity sensor FH A646-1 with cable or
- Psychrometer FN A846 with cable (*only with programming Ntc and P rH !*)

4. Switching the instrument ON

Unlock instrument with the key switch (3) at the front end and switch the instrument ON with key ON/OFF. First, a segment test is carried out. After that, the measured values will be displayed: The **temperature** on the left side of the display and the **relative humidity** in % on the right side of the display.

5. Function keys

The function keys (9) have the primary functions, indicated **above** the function keys:

Programming of parameters	ENTER
Selection of measuring channels	CH▲
Selection of measuring functions	MEASURE
Selection of programming functions	FUNCTION
Control of measurement	START/STOP
Paper feed	PAPER FEED
Switching ON/OFF of the instrument	ON/OFF

After pressing the ENTER key, the secondary functions indicated in white **on** the function keys are available: the keys [-], [↑], [↓] to change digits, the cursor keys [⇨], [⇩], and [Clr] to clear parameters.

With the function keys MEASURE or FUNCTION the following functions can be selected one after the other. To revert to the previous function, the function key has to be pressed for approx. 2 s.

MEASURE		FUNCTION	
measuring function	Abbreviation	Programming function	Abbreviation
measured value	Dim	output mode	OM
maximum value	MH	paper feed	PF
minimum value	ML	or printing cycle	PC
memory (option)	MY	time	TM
		date	DA
		range	R
		Plot range	PR
		limiting value Max.	LH
		limiting value Min.	LL
		with interface cable:	
		baud rate	BR
		instrument address	A

6. Programming the instrument

The default programming is: Plot 1 diagramme, paper feed 20 mm/h. By means of the FUNCTION key the following functions can be selected and programmed:

Output mode (OM)

The climate-printer offers the following output possibilities:

Display	Printout	Function
dr	PRINT LIST	alphanumeric listing on built-in printer
PI 1	PLOT 1	line-graphics in one diagramme on built-in printer
PI 2	PLOT 2	line-graphics in two diagrammes on built-in printer
U	U	alphanumeric output to serial interface
S	-	only storage of measured values (option S)

The output mode is programmed in function 'OM'. After pressing the ENTER key the abbreviation of the output mode is blinking in the display and can be changed with the keys [↑] and [↓]. Pressing the ENTER key again, the selected output mode is confirmed. In PLOT-mode, the arrow 'GRAPH' will appear in the display. In print mode the arrow 'LIST' appears and for output to the serial interface, the arrow 'RS232' is illuminated.

Printout of listing:

ALMEMO 6290-7K E 0.07 0000-1

PRINT CYCLE: 00:00:04 PRINT LIST
 TEMPERATURE LL: +18.00 LH: - - - °C
 HUMIDITY LL: - - - LH: + 45.0 %rH

14.04.05			
11:30:58	1: + 19.69 °C	2: + 40.7 %H	
11:31:03	1: + 19.67 °C	2: + 40.9 %H	
11:31:07	1: + 19.67 °C	2: + 40.9 %H	
11:31:11	1: + 19.66 °C	2: + 40.8 %H	
11:31:15	1: + 19.67 °C	2: + 41.0 %H	
11:31:19	1: + 19.67 °C	2: + 41.6 %H	
11:31:23	1: + 19.68 °C	2: + 45.0 %H	
11:31:27	1: + 19.69 °C	2: + 46.9 %H	
11:31:31	1: + 19.70 °C	2: + 49.3 %H	
11:31:35	1: + 19.69 °C	2: + 50.3 %H	
11:31:39	1: + 19.69 °C	2: + 50.6 %H	
11:31:43	1: + 19.69 °C	2: + 51.9 %H	
11:31:47	1: + 19.70 °C	2: + 53.2 %H	
11:31:51	1: + 19.69 °C	2: + 53.8 %H	

header

printing cycle, output mode

limiting values

date

measured values

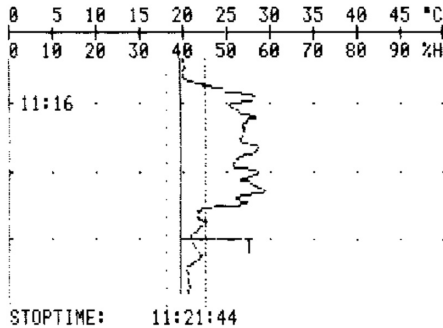
! = limiting value overshoot

Printout of line-graphics:**PLOT 1** (1 diagramme with 2 channels):

ALMEMO 6290-7K E 0.07 0000-1

PRINT CYCLE: 00:00:04 PLOT 1
 TEMPERATURE LL: +18.00 LH: - - - °C
 HUMIDITY LL: - - - LH: + 45.0 %rH

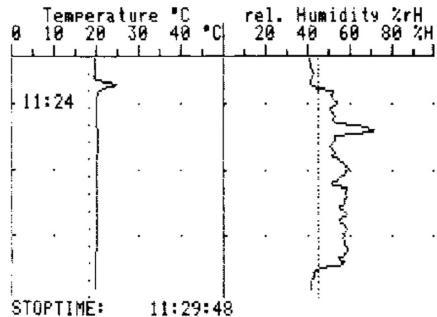
TIME: 11:14:28 DATE: 14.04.05
 PAPER FEED: 320.00 mm/h DIVISION: 2 min

**PLOT 2** (2 diagrammes side by side):

ALMEMO 6290-7K E 0.07 0000-1

PRINT CYCLE: 00:00:04 PLOT 2
 TEMPERATURE LL: +18.00 LH: - - - °C
 HUMIDITY LL: - - - LH: + 45.0 %rH

TIME: 11:22:23 DATE: 14.04.05
 PAPER FEED: 320.00 mm/h DIVISION: 2 min

**Selection of plot range (PR)**

The following plot ranges can be selected in the plot mode:

- PR 1: 0 to +50 °C / 0 to 100 % rH
- PR 2: -10 to +40 °C / 0 to 100 % rH
- PR 3: -20 to +80 °C / 0 to 100 % rH *)
- PR 4: +15 to +35 °C / 15 to 65 % rH
- PR 5: +18 to +28 °C / 35 to 55 % rH

*) Note operating range of temperature/humidity sensor !

The plot range is programmed in function 'PR' in the same way as the output mode.

Data input

Using the numerical functions, the desired values are programmed with the function keys ENTER, [-], [↑], [↓] and [⇌] in the following way.

1. Press ENTER key: the first digit will flash.
2. Change sign with key [-].
3. Enter the desired values with keys [↑] or [↓].
4. Select next digit with key [⇌] and enter in the same way.
5. Repeat ENTER-procedure until the last digit is entered and confirm with ENTER.

Paper feed (PF)

If the output mode is set to 'GRAPH', the velocity of paper feed can be programmed in the range 0,01 to 640 mm/h. The desired values are entered in function (PF) in mm/h.

Printing cycle (PC)

For output of listing 'dr' the printing cycle 'PC' has to be entered in format hh:mm:ss instead of the paper feed. The output is carried out within the programmed time interval.

Time and date (TM), (DA)

For recording the measuring time the measuring instrument has a built-in real-time clock with date. It is buffered with an own Lithium-battery, so that time and date are kept even when switching the instrument OFF or in case of discharged batteries.

Select function 'TM' and enter the time in format hh:mm:ss.

Select function 'DA' and enter the date in format dd:mm:yy.

Limiting values Max (LH), limiting values Min (LL)

For each measuring channel (channel 1: temperature, channel 2: rel. humidity) two limiting values (MAX and MIN) can be programmed. In case of a limiting value overshoot, the arrow 'ALARM' will appear in the display. The alarm will only be cancelled again, when the limiting values in question have been undershot by at least 10 digits (hysteresis).

1. Switching from channel 1 to channel 2 is done with key CH▲.
2. The limiting values are programmed in the same way as described for data input.
3. Programmed limiting values are cleared by pressing ENTER and [Clr] one after the other.

Alarm message

If an off-normal value occurs, it can be relayed as an alarm state to corresponding signalling devices. For this purpose, our range of accessories includes a special alarm module ZA 1000 GK, which is connected to output socket A1 / A2 (2). It consists of an optocoupler (load capability 24V, 20mA, note polarity!), which closes a contact in case of an off-normal state. This will enable you for example to actuate our relay adapter ZB 2280-RA directly.

7. Measurement

Start measurement with key START/STOP.

The arrow 'START' will illuminate, the cyclic data recording starts and the data are printed out in the selected output mode. In GRAPH-mode the cycle is determined by the paper feed. In any case, the printout is started when eight measurements have been recorded.

Keyboard locking:

To protect the instrument against unauthorized use, the keyboard can be locked by means of the key switch (3). When the instrument is locked, the function keys can NOT be operated.

Finishing measurement:

Press START/STOP key. The stop time is printed out, the cyclic measurement is finished and the arrow 'START' disappears.

Max-Min-values:

Display the maximum values of both channels in function 'MH' and the minimum values in function 'ML' by means of key MEASURE.

Select the measuring channel by means of key CH▲.

Clear Max-Min-values by means of keys ENTER, [Clr].

Switching OFF the instrument:

Press ON/OFF key to switch OFF the instrument.

Sleep mode:

For longterm-measurements the climate-printer can be operated in a sleep mode. In this way up to 5000 cycles can be measured in LIST-mode and up to 15000 cycles in GRAPH-mode. The printing cycle has to be larger than 1 minute, the paper feed smaller than 20mm/h.

1. Start the cyclic output normally by means of START/STOP key.
2. Press the ENTER key. The first sign of the dimension is blinking.
3. Press the SLEEP key. In the display "SLEEP ON" will appear briefly and the display extinguish. The instrument is switched ON only for measurement recording and for printout.
4. Finish Sleep mode by means of ON/OFF key.

8. Memory output (option S)

With option S the climate-printer is equipped with a circular memory for 100 000 measured values. Using the output mode 'S', the measured values will only be stored first and can be printed out later. After the measurement the stored data can be output in total or in parts in any output form. To realize this, there are special function for the memory, which define output mode, plot range and time interval only for the memory-output, but do NOT change the programming of the instrument and the sensors. First, press MEASURE key to select function MEMORY 'MY'. The last stored measured value will be displayed. Then, press the FUNCTION key with simultaneously activated function MEMORY. The following functions for memory output will be available, indicated by a blinking arrow 'F' to distinguish them from the standard functions:

MEASURE

Meas. function

measured value
maximum value
minimum value
memory

Abbreviation

Dim
MH
ML
MY



FUNCTION

Memory output functions

free memory
output mode
start time
end time
start date
end date
plot range

F

▲ blinking

Abbreviation

FR
OM
ST
ET
SD
ED
PR

In function **Free memory** 'FR' the free memory space will be displayed in kByte. If the memory is full '0.00 FR' will be displayed and old measured values will be overwritten. The memory is cleared with keys ENTER, [Clr].

The functions **output mode** 'OM' and **plot range** 'PR' are the same as the normal functions.

Using functions **start time** 'ST' and **end time** 'ET', as well as **start date** 'SD' and **end date** 'ED' a part of the whole memory can be defined and printed out. The data input is done in the same way as for date and time.

9. Inserting thermo-paper

If nearly all paper is used up, a red stripe will appear on the paper. The remaining paper should be removed and replaced by a new roll of paper. To remove the covering cap press the raised area and pull it upwards. The thermo-paper has to be cut straight before inserting it. Then push it through the slot at the front side of the paper tub (5) and press the PAPER FEED key until the edge of the paper reaches the printing head (6).

10. Charging the built-in battery

Display "BAT" means: Battery will be discharged soon, printer operation not possible (started instrument reports "Stop time..., Batt. discharged").

For charging the batteries or power supply of the instruments the mains adapter (7,5V/450mA) should be used. After connecting it to socket (4) at the backside of the instrument, charging of the batteries is indicated by the illuminated control lamp "LOAD" (8). The accu is fully charged after at least 4 hours and the control lamp starts blinking, that means the charging circuit has switched to float charge.

11. Reset

We have designed our climate-printer to operate reliably and error-free under permissible operating conditions. If the instrument does not behave as you expect, it may be necessary to reinitialize the instrument completely. Resetting of this nature is also recommended if you wish to eliminate programming errors. To carry out reinitialization, depress the [Clr] key. This will put the instrument to its default settings (time and date cleared, paper feed 20 mm/h and output mode Plot in 1 diagramme).

