INSTRUCTION BOOK & GUARANTEE

Electronical stopwatches

DELTA E 100
DELTA E 200
SPECTRON

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BEDIENUNGSANLEITUNG & GARANTIE
Elektronische Stoppuhren
DELTA E 100, DELTA E 200, SPECTRON  S. 3

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Electronical stopwatches
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INSTRUCCIONI DE USO & GARANTIA
Orologio contaminuti
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This handhart-stopwatch 1882

No. ____________________________

made under the most careful production and control methods, by specialists using only the best materials, is guaranteed for

3 (three) years.

from date of original purchase against defect in material and workmanship. If this stopwatch should become defective within this period you are entitled to get it repaired or exchanged free of charge. Defects resulting from abuse of the stopwatch are not covered by this guarantee: for instance, if contact springs are corroded by batteries which have leaked. Batteries are not covered by this guarantee. After every opening of the case stopwatch has to be checked again regarding watertightness.

Shop-owner and co-garanter: ____________________________

sold on: ____________________________
**Technical Data:**

**Temperature range:**
in use \(-15°\text{C} to +55°\text{C}\)
in storage \(-25°\text{C} to +65°\text{C}\)

**Battery:**
- **Type:** Micron cell AAA
- **Capacity:** about 5 – 6 years
- **Indicator:** when the battery symbol appears in the display, there’s sufficient power for approximately another 3 months

**Display:**
- 15 digits, 7 mm digit-height
- a window for functions indicator and battery indicator

<table>
<thead>
<tr>
<th>Function</th>
<th>Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split</td>
<td>9 h, 59 min, 59 sec, 99/100 = 7 digits lower row</td>
</tr>
<tr>
<td>Lap</td>
<td>59 min, 59 sec, 99/100 = 6 digits upper row</td>
</tr>
<tr>
<td>Event-Count max. 99</td>
<td>= 2 digits middle row</td>
</tr>
</tbody>
</table>

additionally on Delta E 200:
- **Pacer:** 1 to 300 tones/minute = 3 digits upper row
- **Count-Down 59 min, 59 sec, 9/10** = 5 digits upper row

additionally on SPECTRON:
- **Count-Down 59 min, 59 sec, 9/10 sec** = 5 digits upper row
- **or 9999 min, 99/100 min** = 5 digits upper row

**Case:** made of [ABS], water resistant acc. to DIN 8310

**Weight:** 85 g
Accuracy: +/- 7 sec/month
Measuring units: E 100 and E 200 1/100 sec
SPECTRON 1/100 sec + 1/100 min
Memories: 65

Functions E 100:
- Start/Stop, Split/Lap, Short/Lap, Time, Memory-Recall with Quick Recall and Evaluation
- Date is programmed until the year 2016

additionally for E 200
- CD [Count-Down]
- Pacer
- Memory-Recall with evaluation of the shortest and longest LAP Time

additionally for SPECTRON
- CD [Count-Down]
- Memory-Recall with evaluation of the shortest and longest LAP Time
- Selectable time measuring units

Keys four
START/STOP, SPLIT/LAP, MEM/SET/DISP, MODE

Changing the battery
Remove the back of the case (7 screws).
Install the new battery, observing the correct polarity! After changing a battery, the date and time must be inserted again.

Legend explaining the various technical terms:
SPLIT: Is the time accumulated after each point in time.
The last Split Time is also the total time.
LAP: Is the difference in time between the previous point in time measured and the current time.
SHORT: Is the shortest Lap Time measured.
CD: Count Down (counting down from the highest value)
PACER: Pace-setter (the number of tones per minute)
Memory: The time values in the memory.

Available functions
a) Resetting of the stop watch
b) Changing the MODE (function)
c) Measurement of time periods
d) Event Counter
e) Pre-setting of the Split-Time
f) Memory Recall with Quick Recall and evaluation
g) Count Down E 200 + SPECTRON
h) Pacer E 200
i) Setting of the time, date, CD, Pacer, and measuring units
a) **RESETing of the watch**
   By pressing the START/STOP and MODE keys at the same time, all times and values are erased from the memory. Date and Time of Day remain in memory. The display in the function window then shows LAP.

b) **MODE (Change of functions)**
   By pressing the MODE key, the functions are changed in the versions indicated in the following sequences:
   E 100 LAP → S_LAP → TIME → DATE and back to LAP
   E 200 LAP → S_LAP → TIME → DATE → CD → PACER
   and back to LAP
   Spec. LAP → S_LAP → TIME → DATE → CD → empty
   and back to LAP

   The active function is indicated in the function window. The times and values corresponding to these functions are shown in the upper row of the display, as follows:
   **E 100 LAP:** Lap Time 6 digits
   **E 100 S-LAP:** Lap or Short Time 6 digits
   **E 100 TIME:** Time of day 23:45,59
   **E 100 DATE:** Date (Europe) 01.01.08 (01. Jan. 2008)
   (USA) 01.01.08 (01. Jan. 2008)

   Additionally on E 200
   **PACER:** signals/min 3 digits
   50 ms accuracy
   **CD:** Count-Down 5 digits
   1/10 sec-accuracy

   Normally the Split Time is shown in the lower row of the display.

   **A note on LAP, S-LAP and TIME**
   Once the watch has been started and the time is being measured, a selection can be made only from among these three functions.

   **A note concerning CD**
   After a start, it is not possible to change the Mode. However, virtually the same time measurement can be completed with START/STOP and SPLIT/LAP (see CD function)

   **A note concerning PACER**
   After a start, it is not possible to change the Mode. However, the total time is measured and the START/STOP function remains operative (see Pacer function).

c) **Measuring times**
   - Select the one of the function LAP, S-LAP or TIME by means of the MODE key.
   - The watch is started by means of the START/STOP key. Time measurement begins and is visible while in operation. The figure (a running man) indicates this condition.
   By pressing the START/STOP key again, Split Time and Count Down are stopped. This sequence can be repeated as often as desired.
By pressing the SPLIT/LAP key, the Split Time and Lap Time values at the moment are stored in memory. The Split-Time indicator will appear to have stopped. This, however, is only to facilitate reading the time measured. If, after pressing SPLIT/LAP, you want a current and visible reading, quickly press the DISP/MEM key.

S-LAP as an additional function: After recalling the time with the SPLIT/LAP key, the current Lap Time will appear in upper area of the display, alternating at the rate of 2 cycles with the shortest Lap Time up to that point, which is indicated in the display by the symbol SHORT.

d) **Event-Counter** (2 digits in parentheses):
- Shows the number of times the SPLIT/LAP key has been activated (maximum is 99).
- In memory recall, it indicates which memory has been accessed.

e) **Advance of Split Time:**
By pressing the START/STOP and SPLIT/LAP keys at the same time, the current time of day, rounded off to the next full minute, will be entered into the Split counter. After pressing the START/STOP key, the measurement proceeds, beginning with the time just entered. The purpose of this feature is to synchronize the Split Time with an official clock. After actuating this feature, it is no longer possible to stop the watch; to do so would desynchronize it. Only the SPLIT/LAP key remains active. Time advance is limited to the functions LAP, S-LAP and TIME.

f) **Memory Recall:**
- At any time while time is being measured, a memory may be accessed by pressing the DISP/MEM key. The first 64 values recorded are stored in the first 64 memories. The last, 65th memory always holds the last time measured if more time values were stopped than there were memories to store them.

- **Procedure:**
  Press and hold the DISP/MEM key. The time stored will be displayed as long as the key is pressed. During this phase, the symbol M-OUT is displayed, and directly under it the memory which is recalled. By pressing the DISP/MEM key again, the time stored in the next memory will be displayed, and so forth. If the time displayed is the shortest Lap Time recorded, the symbol SHORT is also displayed.

Additionally in E 200 + SPECTRON
You will hear a tone following the shortest Lap Time with the sound sequence: 100 milliseconds TONE followed by 400 milliseconds of silence

If the time indicated corresponds to the longest Lap Time, you will hear a tone with the sound sequence: 400 milliseconds TONE followed by 100 milliseconds of silence.

- Quick Recall [applies to all versions]:
  First press the DISP/MEM key and then the MODE key together, which will initiate a Quick Recall of the times measured which are stored in the memory. When the shor-
test or longest Lap Time is found, the search will be interrupted for a moment. After comparing all the memories, Quick Recall will return to the first memory, and the search will be terminated.

g) Additionally function in E 200 + SPECTRON:
   CD (Count-Down with Auto-Repeat)
   - Selection of the CD function by means of the MODE key
   - Before the first start, a CD time must be entered
   - Although the only CD function is displayed, the Split Time and Lap Time can also be measured.
   - The watch is started by means of the START/STOP key. Split Time and Count Down are visible while in operation. The figure of a running man indicates this condition. By pressing the START/STOP key again, Split Time and Count Down are stopped. This sequence can be repeated as often as desired.
   - By means of the SPLIT/LAP key, the Split Time and Lap Time values at the moment are stored in memory. The Split Time appears to have stopped. This, however, is only to facilitate reading. The Count Down (upper display) continue in operation (except after the START/STOP key has been pressed).
   - When the CD function reaches the value of 0 (zero), a tone will sound for 2 seconds. The sequence of operations begins immediately and automatically, using the value originally entered (Auto-Repeat).
   - The Lap Time with the associated Split Time can be read out by using the Memory Recall (see below).

h) only of E 200
   PACER 1-300 tones/minute
   (time with an accuracy of 50 milliseconds)
   - Selection of the Pacer function by means of the MODE key.
   - Before the first start, a time interval must be entered (1-300).
   - The watch is started by means of the START/STOP key. The continuing Split Time function is indicated by the figure of a small running man . By pressing the START/STOP key again, the Split Time function can be stopped. This sequence can be repeated as often as desired.
   - By pressing the SPLIT/LAP key while the time measurement function is in operation, the time interval may be raised to the next possible level.
   - The concept of „next possible level” is explained below under the heading of „Setting the Pacer”.

i) Setting is only possible after a Reset.
   - Resetting the watch.
   - Time of Day and Date may, but need not be set. For this reason, the symbol SET appears only after the Set command (SET key).
   - CD and PACER must be set before Start. The symbol SET appears immediately as a warning to set the watch.

Setting the Time of Day 4 digits: hh: mm
   - Press the MODE key until TIME appears. Then press the SET key, the symbol SET appears in the display; this prepares the watch for the Set procedure.
- Continue to press the SET key until the digit which is to be set begins to flash. Press the SPLIT key to advance the flashing digit (0-5 or 0-9).
- Seconds cannot be set. To synchronize them, round off the minutes while setting the watch, and wait until the clock with which the watch is to be coordinated reaches the minute and seconds desired.
- To terminate the Set procedure, press the MODE key; this immediately advances the display to the next MODE.

**Setting the date**

6 digits:
- Europe version: tt, mm, jj
- USA version: mm, dd, yy
- Press MODE until the symbol DAT appears in the display. Then press MEMO until the symbol SET appears in the display.
- Continue to press the SET key until the digit to be set begins to flash. Press the SPLIT key to advance the flashing digit (0-5 or 0-9).
- To terminate the Set procedure, press the MODE key; this immediately advances the display to the next MODE.

**E 200**

**Setting PACER** (3 digits: 1 to 300 pulses per minute, to an accuracy of 50 milliseconds)
- Press the MODE key until the PACER function is displayed.
- The Set function is already activated.
- Continue to press the SET key until the digit which is to be set begins to flash. Press the SPLIT key to advance the flashing digit (0-5 or 0-9).
- Interpolation: If, during input, a value has been entered which is mathematically not capable of solution, then the value displayed will be rounded off after the MODE key has been pressed to the nearest higher or lower value. For example: you entered 72 tones per minute; this would imply a sequence of tones at an interval of 0.8333 seconds; unfortunately, such a sequence cannot be produced with the accuracy desired; the next feasible value will automatically be selected, i.e., 0.85 seconds, which corresponds to the rate of 70 pulses per minute.
Below is a conversion table which shows how the value entered is interpolated to a feasible value. The table is accurate to +/- 25 milliseconds.

<table>
<thead>
<tr>
<th>Entered</th>
<th>Becomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-36</td>
<td>1:1</td>
</tr>
<tr>
<td>37</td>
<td>38</td>
</tr>
<tr>
<td>38-41</td>
<td>1:1</td>
</tr>
<tr>
<td>42, 43</td>
<td>42</td>
</tr>
<tr>
<td>44, 45</td>
<td>44</td>
</tr>
<tr>
<td>46, 47</td>
<td>46</td>
</tr>
<tr>
<td>48, 49</td>
<td>48</td>
</tr>
<tr>
<td>50, 51</td>
<td>50</td>
</tr>
<tr>
<td>52, 53</td>
<td>52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entered</th>
<th>Becomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>54, 55</td>
<td>54</td>
</tr>
<tr>
<td>56-58</td>
<td>57</td>
</tr>
<tr>
<td>59-61</td>
<td>60</td>
</tr>
<tr>
<td>62-64</td>
<td>63</td>
</tr>
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<td>65-68</td>
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</tr>
<tr>
<td>69-73</td>
<td>70</td>
</tr>
<tr>
<td>74-78</td>
<td>75</td>
</tr>
<tr>
<td>83-88</td>
<td>85</td>
</tr>
<tr>
<td>89-96</td>
<td>92</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entered</th>
<th>Becomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>97-104</td>
<td>100</td>
</tr>
<tr>
<td>105-115</td>
<td>110</td>
</tr>
<tr>
<td>116-127</td>
<td>120</td>
</tr>
<tr>
<td>128-139</td>
<td>135</td>
</tr>
<tr>
<td>140-159</td>
<td>150</td>
</tr>
<tr>
<td>160-190</td>
<td>175</td>
</tr>
<tr>
<td>191-219</td>
<td>200</td>
</tr>
<tr>
<td>220-268</td>
<td>240</td>
</tr>
<tr>
<td>269-300</td>
<td>300</td>
</tr>
</tbody>
</table>

The following values reflect exact times without adjustments:
1, 2, 3, 4, 5, 6, 8
10, 12, 15, 16
20, 24, 25
30, 40, 50, 60, 75, 80
100, 120, 150
200, 240, 300

**SPECTRON:**
**Measurement Units** 1/100 min or 1/100 sek
- Press the MODE key until the function field of the display is empty. The symbol SET is activated.
- The time unit is toggled by means of the SET key.
  The following symbols will appear in the upper display
  59:59 (with semicolon) = measuring unit is seconds
  9999 (without semicolon) = measuring unit is minutes
- To terminate the Set procedure, press the MODE key.

Consumers are legally required to dispose of batteries at suitable collection points, vending points or dispatch bays. The crossed-out wheeled bin means that batteries must not be disposed of in the household waste. Pb, Cd and Hg designate substances that exceed the legal limits.
To whom it may concern

We, ADOLF HANHART GMBH & CO. KG located in Gütenbach, Germany, certify that our Electronic LCD stopwatches are tested on equipment Q3000 of Witschi. This control equipment is calibrated to the signal DCF-77 coming from the transmitting station MAiNFLIEGEN and controlled by the atomic clock of BRAUNSCHWEIG coordinated with the N. I. S. T.

Tolerance for: Magma 10, Magma Pro, Profil 5, Delta 100/200, Spectron, Prisma
are +/- 7 seconds per month or 0.00027 %
at 22 degrees Celsius

Tolerance for: Modul, Accord, Mesotron
are +/- 14 seconds per month or 0.00054 %
at 22 degrees Celsius

Tolerance for: Profil, Stopstar, Stratos, Ultra, Phoenix, Programtimer 100
are +/- 30 seconds per month or 0.0012 %
at 22 degrees Celsius

Date:

ADOLF HANHART GMBH & CO. KG
K. Eble

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EAI

Eric Armin Incorporated
Franklin Lakes, NJ 07417-0644
E-Mail: info@eaiusa.com  Internet: www.eaiusa.com
To whom it may concern

We, ADOLF HANHART GMBH & CO. KG located in GÜTENBACH, Germany, certify that our mechanical stopwatches are tested on equipment DCF TiMEr of FLUME, calibrated and traceable to the signal DCT 77 coming from the transmitting station MAINFLIEGEN and controlled by the atomic clock of BRAUNSCHWEIG coordinated with the N.l.S.T.

The tolerance is 0 up to 48 seconds per 24 hours for pin lever stopwatches type 111/112/121/122 1/10 sec., the tolerance in percentage is 0.056%.

The tolerance is 0 up to 36 seconds per 24 hours for pin lever stopwatches type 111/112/121/122 sec., 1/5 sec. the tolerance in percentage is 0.042%.

The tolerance is 0 up to 36 seconds per 24 hours for lever stopwatches type 115/125 1/10 sec., the tolerance in percentage is 0.042%.

The tolerance is 0 up to 24 seconds per 24 hours for lever stopwatches type 115/125 1/5 sec., the tolerance in percentage is 0.028%.

The tolerance is 0 up to 24 seconds per 24 hours for lever stopwatches type 135/137 1/10 sec., the tolerance in percentage is 0.028%.

The tolerance is 0 up to 24 seconds per 24 hours for lever stopwatches type 135/137 1/5 sec., the tolerance in percentage is 0.022%.

The tolerance is 0 up to 20 seconds per 24 hours for lever stopwatches type 185, the tolerance in percentage is 0.022%.

Date:

ADOLF HANHART GMBH & CO. KG
K. Eble

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E-Mail: info@eaiusa.com  Internet: www.eaiusa.com
Externer Anschluß

Die Prellzeit der externen Schalter muss unter 8 ms liegen. Impulslänge mindestens 50 ms.

Die nachfolgend gezeigten Ansteuerungsmöglichkeiten lassen sich kombinieren z.B. Möglichkeit 1 für Start- und Möglichkeit 3 für Split-Messung.