

**JUNDES**

**Handbook  
KHU 2000**

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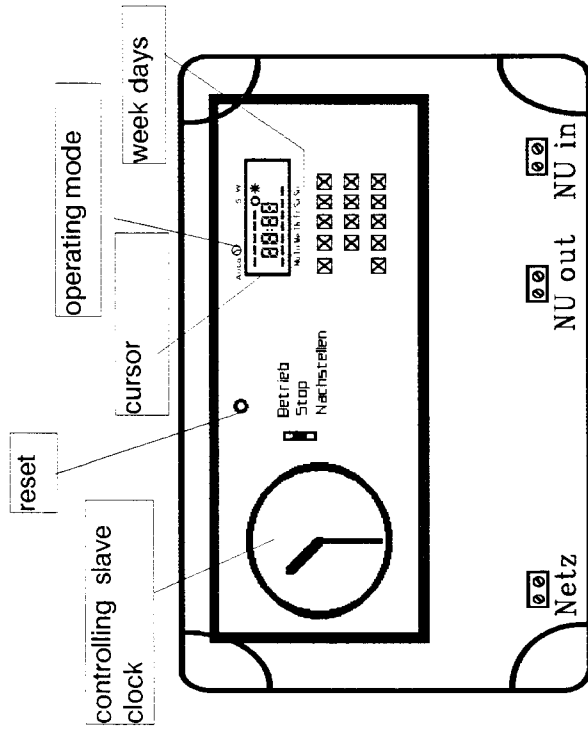
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## 1. Technical data

Operating voltage:	230V ; 45-60 c/s
Power requirement:	appr. 8 VA
Temperature range:	-5 to + 50 °C
Slave clock output:	500 mA at 24 V 1000 mA at 12 V = 50 SCL (SCL = slave clock loads)
Slave clock input:	for polarized minute impulses 3-60 V
Power reserve (optional):	appr. 24h
Max. reserve cache:	appr. 3 days
Time base:	4,19 MHz-quartz
Max. tolerance:	+ -1 min./year
Summer/winter time changeover:	programmable up to 6 days in advance max.
Operating modes:	master clock (HU) sub-master clock (UHU) pulse amplifier(UHU)

## 2. Connection diagram

III. 1



## 3. Installation notes

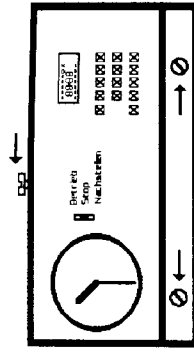
The ideal environment is somewhere dry where direct sunlight and vibration can be avoided.

The clock's electronics are protected against the usual effects of interference. Despite integral suppression, it may be advisable to employ an additional mains filter where intensely fluctuating alternating current power supplies are encountered.

## 4. Operating

### 4.1 Opening housing:

Loosen the 3 mounting screws  
Schr. 1, Schr. 2 und Schr. 3.  
Remove housing upwards (see  
ill. 2).



Ill. 2

### 4.2 Setting to HU (master clock) or UHU (sub-master clock):

The unit can be operated in 2 different modes (see ill. 3).

Operating mode 1: HU = master clock

Operating mode 2: UHU = sub-master clock  
or pulse amplifier (see ill. 3).

The sliding switch for setting these two modes  
is located on the small vertical plate. Upper po-  
sition = UHU, lower position = HU. In the HU

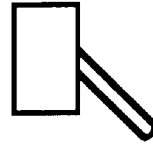
setting, the clock runs autonomously based on  
internal timing. In the UHU setting, the clock can be operated from  
another master clock. In this event, time control comes either from  
the slave clock line of the first master clock or from the radio re-  
ceiver.



Ill. 3

### 4.3 Line voltage

On the base plate, a 3 positions tumbler  
switch is located which will be in its middle  
position when delivering. For clock installa-  
tions 12 V the switch must be brought in the  
left, for 24 V installations in the right position.



12V 0V 24V

### 4.4 Mounting

The measurements required for placing the wall plugs appear in  
ill. 4 (mounting diagram). The unit should be mounted firmly to the  
wall.

## 5. Connections

The KHU 2000 is fitted with seven cable knock outs underneath  
the base plate which can be removed by firmly squeezing the walls  
and pushing out. The caps then can be cut to suit cable thickness.

### 5.1 Mains connection

The mains cable should be preferably passed through the lefthand  
knock out. The power supply is 230 V 45-60 c/s (ill. 1).

### 5.2 Slave clock input (NU in):

When operating the unit as sub-master clock (UHU), the slave  
clock line should be connected to the slave clock input (polarized  
minute impulses 3-60 V). A radio receiver (FU 550) can also be  
connected to this input (ill. 1).

### 5.3 Slave clock output (NU out):

The slave clock line (12/24 V) which shall be controlled by the  
KHU 2000 has to be connected to the central binder (ill. 1).

### Warning!

After mounting the unit make sure to refit the housing cover and  
fit screws (Schr. 1, Schr. 2, Schr. 3 - see ill. 2).

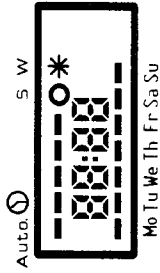
Lift glass lid using handle in order to adjust the clock (lid will stay  
open).

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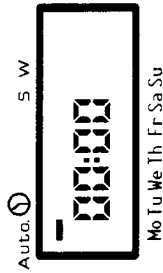
## 6. Delivery condition

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The clock will be delivered with unloaded accumulator.  
Upon connection to mains all symbols on the display are briefly lit (ill. 5).  
Display control:



Ill. 5:  
Thereupon appears



Ill. 6: display blinks  
The clock is now ready for operation.

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## 7. Operating mode

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**Brief description:**

**Warning!** The operating guide indicates operating mode (see ill. 1).

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**Auto**

Normal setting during operation.  
Display shows week day, time of day, summer/winter.



Entry of current time or time correction.

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This mode is not used for KHU 2000, no indication in display.

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This mode is not used for KHU 2000, indication "FULL" in display.

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This mode is not used for KHU 2000, indication "00" in display.

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**S/W**

Summer/winter time must be entered in mode "time entry".

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## 8. Key functions

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### Brief description:



**Ring key:**  
Selection of operating mode:  
Automatic Auto; time of day ☉ , S/W:



**Clear key:**  
With operating mode ☉:  
Correction of entered but not saved data.



**Enter key:**  
With operating mode ☉ , S/W :  
Save entered data.



**Return key:**  
With operating mode ☉  
Correction of incorrect entry.



**Numeral keys:**  
With operating mode ☉ :  
Entry of clock time.



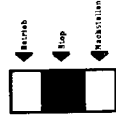
**Week day keys:**  
With operating mode ☉ :  
Entry monday to sunday.



**Summer time key:**  
With operating mode Auto:  
Entry of summer time.



**Winter time key:**  
With operating mode Auto:  
Entry of winter time.



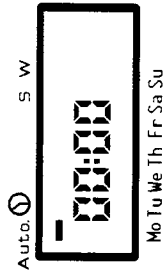
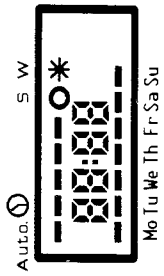
**Operation-stop-adjust switch:**  
for adjusting the slave clock line

## 9. Initial setting

### 9.1 Reset:

To initialize the microprocessor put tip of ball pen or similar in the hole (see ill. 1). On the display appear all symbols for a short time.

Then:



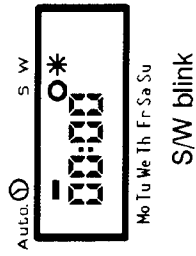
Display blinks

### 9.2 Time entry:

1. summer/winter time
2. current day of week
3. current time

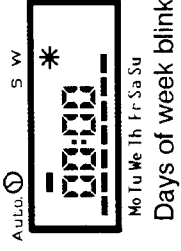
Example: winter time Monday 08:15 h.

1. Use ring key to bring operating guide to mode .



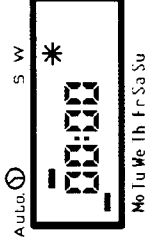
2. Summer/winter time entry:

Press  key.







3. Day of week entry:

Press  key (monday).

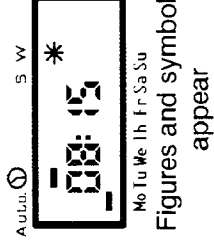


4. Time entry:

Key sequence:    

Warning!

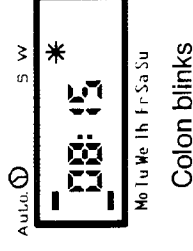
Time should always be entered as 4 digits!



5. Store time:

Press "Enter" key.

Time is now stored.



Operating guide jumps automatically on mode Auto.

### 9.3 Incorrect entry:

An incorrect input during programming can

1. be cancelled using the return key or
2. press **CL** key (delete) to restart programming (see 9.2).

### Warning:

First by pressing the **Enter** key, an entered memory block is transferred to memory.

### 9.4 Summer/winter changeover:

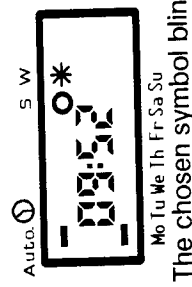
(programmable max. 6 days prior).

1. Use ring key to bring operating guide to mode Auto.

2. Summer or winter changeover:

Press **S** or **W**

key.



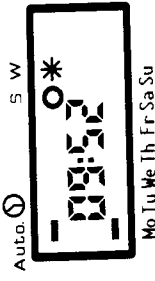
The chosen symbol blinks

3. Storing:

Press **Enter**

key.

Both symbols "O\*" remain visible until automatic changeover on following sunday at 02:00 h.



### 9.5 Programming security:

To prevent impermissible programming, the glass lid can be fitted with a seal. Pass seal wire when lid is closed through the panel seal ring and lid handle and affix seal.

## 10. Master clock functions

### 10.1 Control of connections

Control if mains is connected to the left binder (230V 50 Hz).

The slave clock line has to be connected to the middle binder, 50 slave clocks max.

If required, a radio receiver (FU 550) or a slave clock line has to be connected to the right binder if the KHU 2000 should operate as sub-master clock resp. pulse amplifier. If the KHU 2000 should operate on its own quartz time base, this connection has to stay dead.

### 10.2 Control of switch positions

The 3 positions switch for the slave clock line has to be in its correct position: **left position 12 V, right position 24 V.**

When operating the clock as sub-master clock (pulse amplifier, radio controlled master clock), the sliding switch on the small plate has to be in its **lower** position. When operating the clock autonomously, the switch must be in its **upper** position. If the right binder is connected, the sliding switch must be in lower position.

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## 11. Synchronising system

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Put line switch (operation, stop, adjust) into position Stop.

Operate the reset key by the tip of a ball pen or similar.

Enter the same time as your line exactly as indicated in 9.2.

Now all three times (line time, time of controlling slave clock, display time) have to correspond. If the line time differs by one minute from the two other times, inverse the two wires of the slave clock line.

Put the line switch into position "adjust" till the display shows at least one minute more than current time. Then put line switch in to position Stop.

Put line switch in position "operation" exactly to second. The complete system now works on current time.

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## 12. Adjust system

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After first installation it is no longer necessary to synchronize the system but only to adjust it.

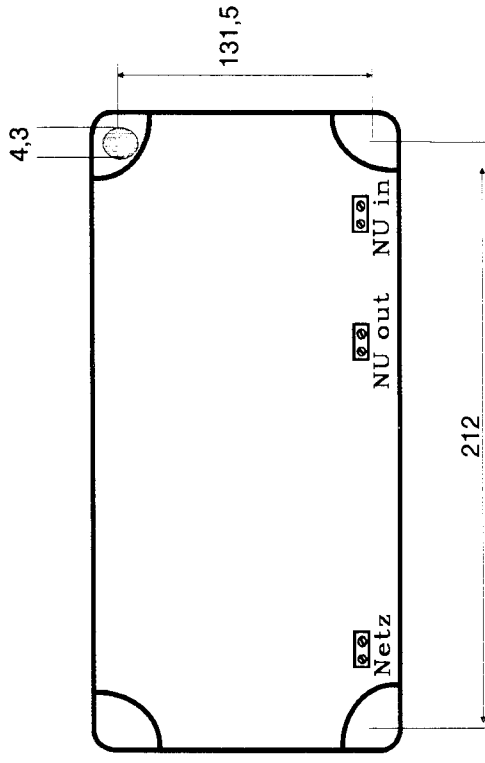
**If the system runs fast**, the line switch must be put in position Stop till current time corresponds to line time.

**If the system runs slow**, the line switch must be put in position "adjust" till the display time shows at least one minute more than current time. Then put into position Stop and put it in position "operation" exactly to second.

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## 13.0 Mounting diagram:

III. 4



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## Spare parts

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### 14.1 Order Nos.

Modules	Order No.
Power pack module	2010/U4
Logic module	2010/U5
Processor module	2010/U6
Set of accumulators	Aku 15
Bottom of housing	2010/U2
Top of housing	2010/U12