

# Installation and Operating

## IBU 190(t) S Movement for minute pulse

Please read these instructions carefully before installation.



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## References to the User's Manual

1. The information in this User's Manual can be changed at any time without previous notice. The current version is available for download on [www.mobatime.com](http://www.mobatime.com) – Downloads.
2. This User's Manual has been composed with utmost care, in order to explain all details in respect of the operation of the product. Should you, nevertheless, have questions or discover errors in this Manual, please contact us.
3. We do not answer for direct or indirect damages, which could occur, when using this Manual.
4. Please read the instructions carefully and start the setting-up of the product, only once you have correctly understood all information for the installation and of the operation.
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## Guidelines for installation and handling



1. This movement has no incorporated disconnect device from the mains supply power. An appropriate disconnect device must be provided external to the movement, concerning to the national installation regulations.
2. The movement has to be transported or stocked only in the original packing and in a dry environment.

# 1. Dimensions, Definitions

| Diameter   | Type                 | Art.-No. |
|------------|----------------------|----------|
| 30 - 80 cm | Movement: IBU 190 S  | 203147   |
| 30 - 80 cm | Movement: IBU 190t S | 202837   |

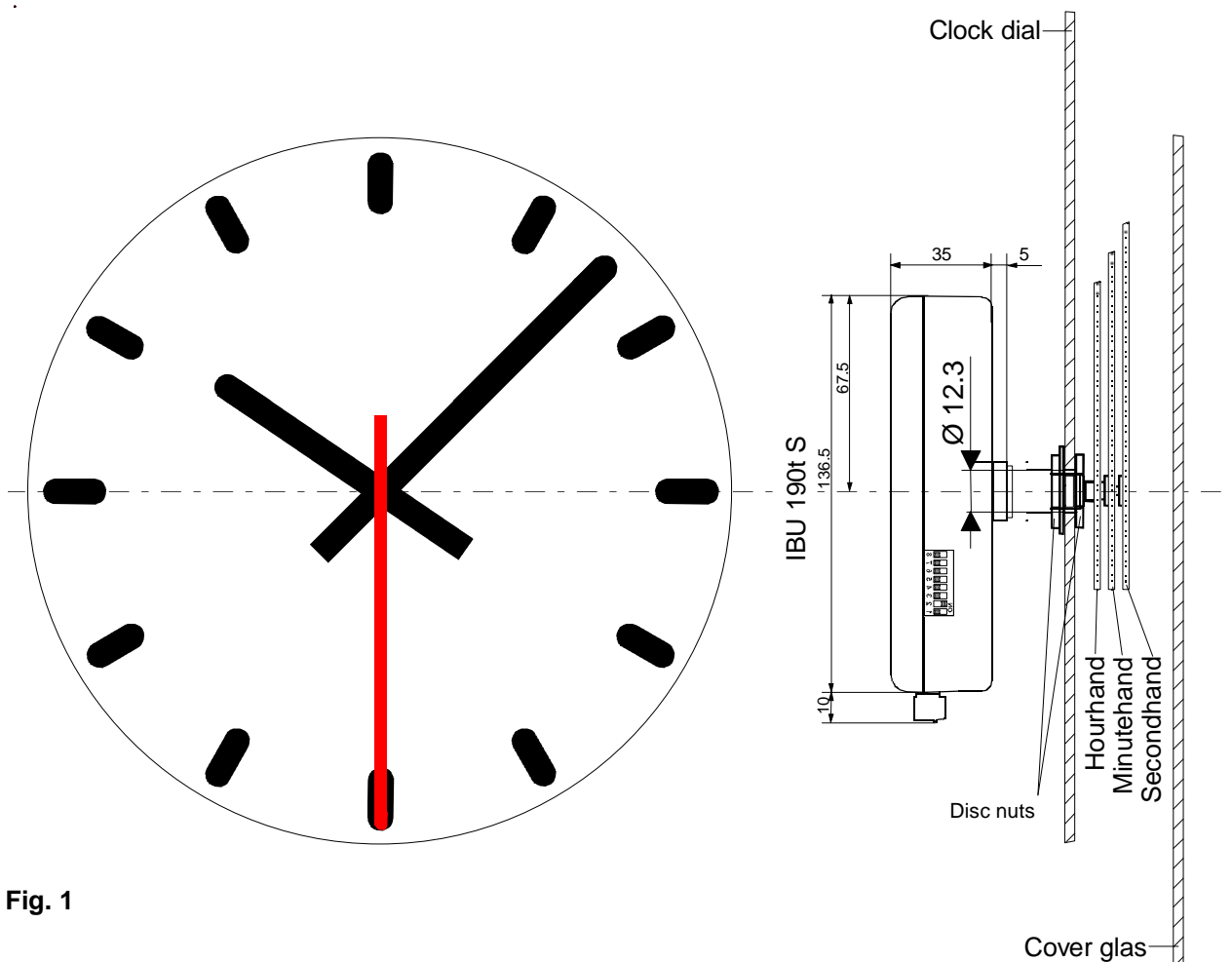


Fig. 1

Connection to the mains supply should be realized according to the class II protection.

Power  
AC 230V  
or 48 VDC

Cable lenght  
550 mm

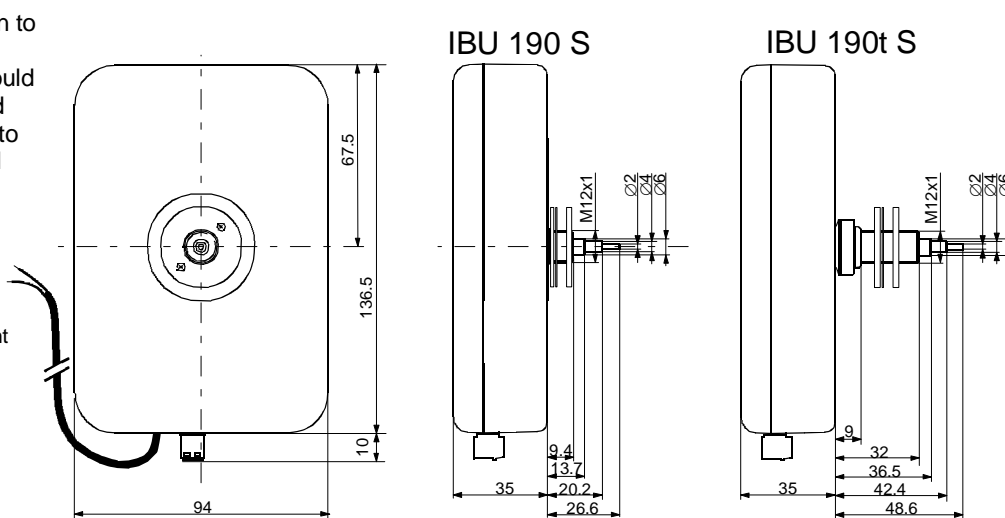


Fig. 2

## 2. Function description

Impulse-Movement for hour, minute and second display. For indoor and outdoor slave clocks with dial diameters up to 80 cm, with or without illumination.

- Minute impulse movement with step motor second hand drive.
- Impulse voltage selectable by means of DIP-switches in the range 24-60 V.
- Impulse polarity selectable with two input connectors.
- Large input voltage range of 45V-265 VAC for second hand drive. Operation with 48 VDC possible as well.
- Electronic synchronization of the second hand from the minute impulse.
- Different running modes of the second hand, selectable by means of DIP-switches.
- Minute- and hour hand control directly from impulse line, independently from the power supply.
- Manually adjustment of the hands over pushbutton.

## 3. Mounting guidelines

### 3.1 Mounting of movement series 190(t) S

The dial must be sufficiently stable. The fixing hole must have a diameter of 12.3 mm.

The movement must be fixed in vertical position.

Vide Fig. 3 for the position of mounting parts.

The disc nut (2\*) M12 x 1 has to be tightened with a special wrench tool (Art. No. 201998) and a torque wrench with a torque of 4.5 Nm +/- 0.2 Nm.

#### Attention:

The ring nut (5), the compensation ring (6) and the spring washer (7) must not be removed.

After tightening of the disc nut (2\*), the movement must not be wrenched!

### 3.2 Mounting of hands and Starting-up

#### 3.2.1 Mounting of hands

The shafts of the hour, minute and second hands are positioned ex-work on the reference position (12 o'clock). The hands shall be carefully fixed and tightened on the shafts. Enough space must be provided between the hands. See Fig. 4.

The position 12 o'clock must be checked on each movement after the mounting (Chap. 3.2.2).

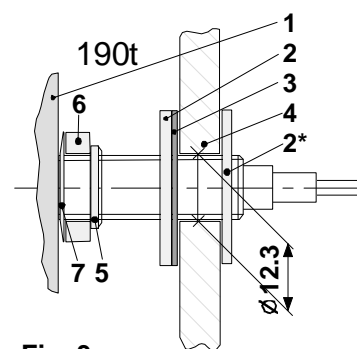


Fig. 3

- 1 Movement
- 2 Disc nut
- 3 Rubber washer
- 4 Dial
- 5 Ring nut
- 6 Compensation ring
- 7 Spring washer

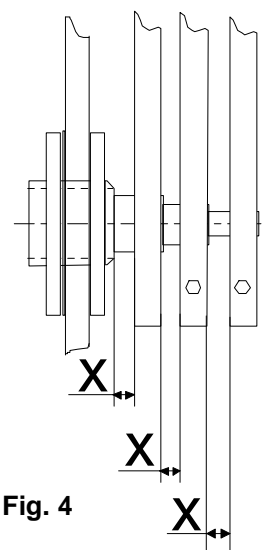
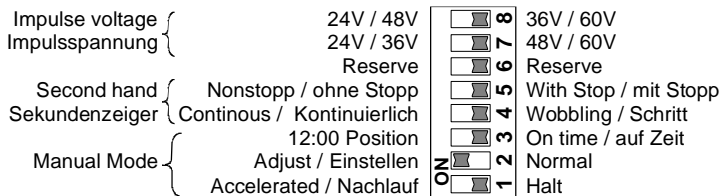


Fig. 4

### 3.2.2 Starting-up and check of the hand position

- Set DIP switch 3 to **ON** position (12:00 Position, Fig. 5)
- Install the AC 230V power supply by using the white two wire cable from the movement. The clock runs to 12 o'clock position  
→ Position of hands OK?
- If the hand position is wrong, carefully loosen the hand, adjust and tighten (don't distort the axis).  
→ Check the 12 o'clock position again (initialising by an interruption of the power supply).
- If the hands position is OK, continue with chapter 5 for the further setting up.



| Impulse voltage | SW 7 | SW 8 |
|-----------------|------|------|
| 60 V            | OFF  | OFF  |
| 48 V            | OFF  | ON   |
| 36 V            | ON   | OFF  |
| 24 V            | ON   | ON   |

Fig. 5

## 5. Setting up / Connection diagrams

- After checking the 12 o'clock position, reset DIP-Switch 3 to **OFF** position (Fig. 5).

### 5.1 Commissioning of a new impulse line

- Stop impulse line on master clock and set line time to 12:00:00.
- Set movement impulse voltage according to the master clock by means of DIP-Switch 7 and 8 (24V impulses: set switch 7 and 8 to ON position).
- Connect impulse line from master clock system to one of the two plugs on top of the movements, e.g. plug **A** (Fig. 6 and 8).
- Start impulse line on master clock for a short time, till at least one pulse was sent to the clock line and stop line again.
- If there are clocks, they stand one minute behind, do the following procedure with them:
  - Change the polarity of the movement by moving the impulse line input from plug **A** to **B** (or reverse if B is connected, see Fig. 6).
  - Push red button (beside switch B) once shortly to execute a single step.
- Start impulse line on master clock again. Now all clocks should run on line time.

## 5.2 Commissioning of an additional movement to a running impulse line

- Connect impulse line from master clock to one of the two plugs on top of the new movement, e.g. plug **A** (Fig. 6 und 8).
- Set DIP switch **2** to **ON** (Adjust).
- Set DIP switch **1** to **ON** (Accelerated). Now clock hands are moving in 1.4 sec. steps.
- Set DIP switch **1** to **OFF**, if clock hands have reached the correct line time.
- Set DIP switch **2** to **OFF** (Normal) and wait for the next minute impulse from master clock.
- If the new clock didn't perform the step, do the following procedure with it:
  - Change the polarity of the movement by moving the impulse line input from plug **A** to **B** (or reverse if B is connected, see Fig. 6).
  - Push red button (beside switch B) once shortly to execute a single step.
- Now the new clock should run on line time.

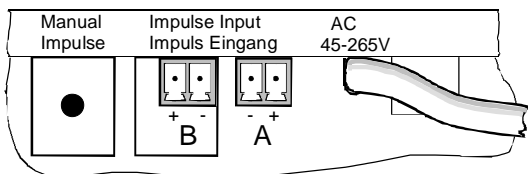


Fig. 6

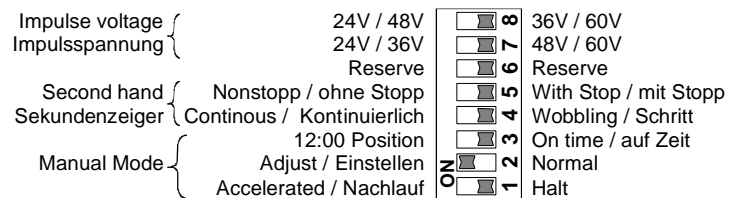
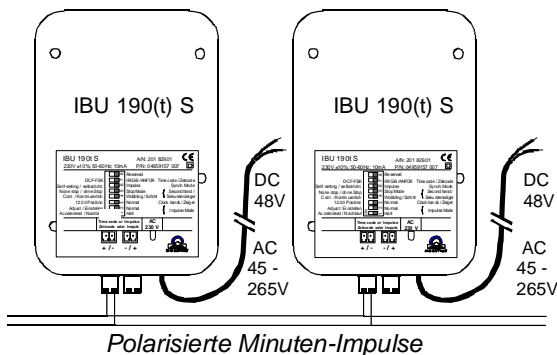


Fig. 7

### Example:



Connection to the mains supply should be realized according to the class II protection.

Fig. 8

## 6. Technical specification

|  | <b>IBU 190 S</b><br>Art no. 203147   | <b>IBU 190t S</b><br>Art. no. 202837 |
|--|--|--------------------------------------|
| Synchronization                                      | Polarized minute impulses  |                                      |
| Setting times:<br>Running time to reference position | max. 7 minutes   |                                      |
| Operation mode second shaft                          | - Continuous <b>or</b> secondly pace shift (wobbling)<br>- 1 revolution in 60 s <b>or</b> 1 revolution in 58 s with stop at 12.00 and start at the minute change |                                      |
| Operation mode minute shaft                          | 1 step every 60 s  |                                      |
| Operation mode hour shaft                            | continuous   |                                      |
| Operation voltage                                    | 45 V – 265 VAC or 48 VDC   |                                      |
| Current consumption at 230 VAC                       | < 2 VA (max. 30 mA)  |                                      |
| Impulse voltage                                      | 24 V / 36 V / 48 V / 60 V (DIP switch)   |                                      |
| Impulse current                                      | 6 mA   |                                      |
| Impulse length                                       | ≥ 1s   |                                      |
| Impulse pause  | ≥ 1s   |                                      |
| Number of motors                                     | 2 (hour / min. + sec.)   |                                      |
| Running reserve after power failure                  | Hour, minute: from master clock / second: no   |                                      |
| Dial diameter  | 25 – 80 cm   |                                      |
| Max. dial thickness                                  | 4 mm   | 14.5 mm                              |
| Temperature range                                    | -30 ... +70°C  |                                      |
| Weight   | 340 g  | 380 g                                |
| Standards  | EN 50121-4, EN 61000-6-3   |                                      |
| Safety   | EN 60950-1, Protection class II  |                                      |

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