

# Installation and Operating

## MLU 190(t) 230 Movement for MOBALine

Please read this instructions carefully before installation.



### 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.
5. The installation must only be carried out by skilled staff.
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### Guidelines for installation and handling



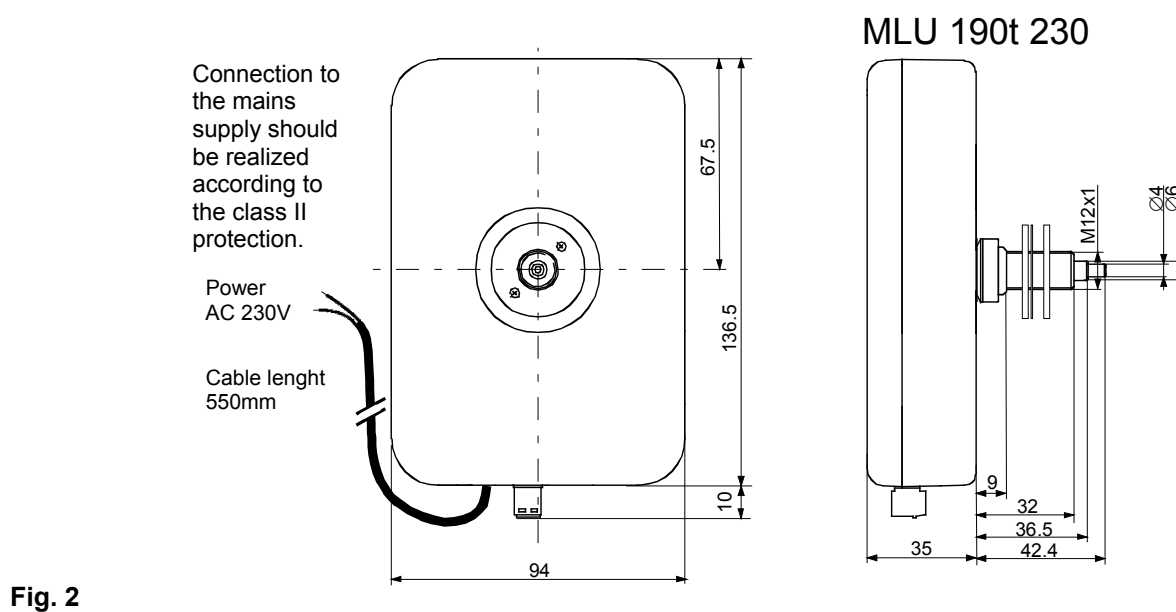
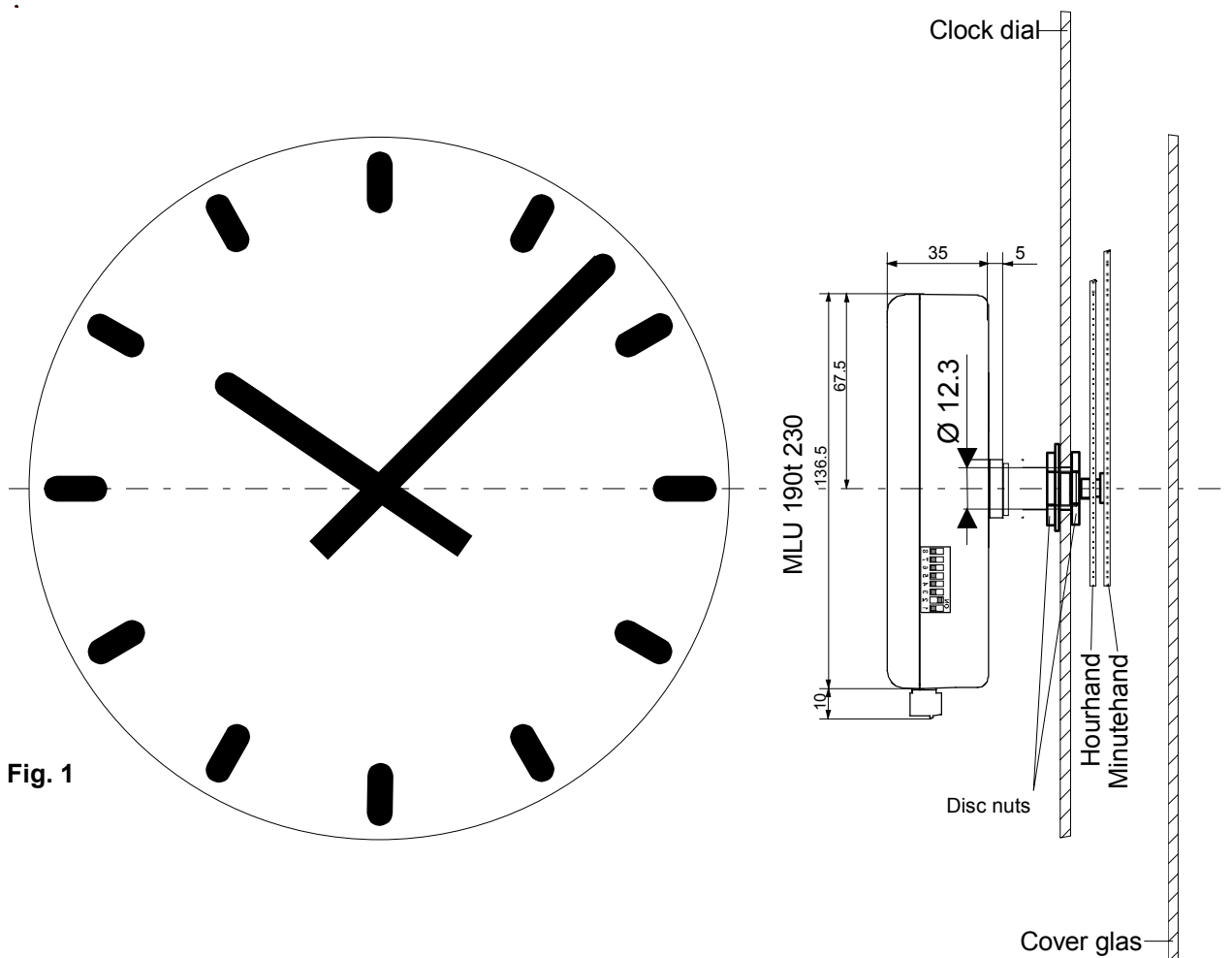
1. This movement has no incorporated disconnect device from the mains supply power. An appropriate disconnect device must be provided external to the movement, concerning to the national installation regulations.
2. The movement has to be transported or stocked only in the original packing and in a dry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

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# 1. Dimensions, Definitions

Diameter	Type	Art.-No.
30 - 80 cm	Movement: MLU 190t 230	201974



## 2. Function description

Self-setting movement with hour and minute display. For self-setting slave clocks for indoor or outdoor use with dial diameters up to 80 cm, with or without illumination.

- **MOBALine** controlled with automatic time take-over and daylight saving time change-over by means of the connected **MOBALine** master clock.
- Signalization of missing **MOBALine** code reception after 24 hours by setting the hands to 12 o'clock position.
- Internal quartz clock for precise time display even during a failure of the **MOBALine** signal.
- Upon mains power failure, hour and minute hands will keep on running, powered by **MOBALine**.

## 3. Mounting guidelines

### 3.1 Mounting of movement series 190t

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!

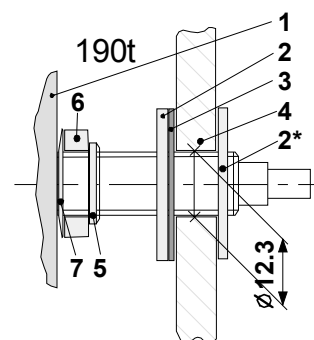


Fig. 3

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

### 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).

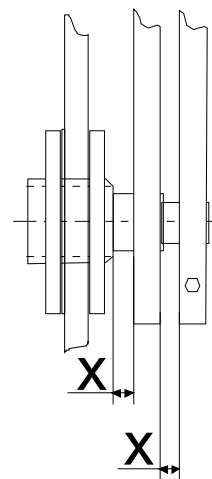


Fig. 4

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

- Set DIP switch **1** 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.
    - ➔ Check the 12 o'clock position again (initialising by an interruption of the power supply).
- If the hands position OK, continue with chapter 4 for further setting up.

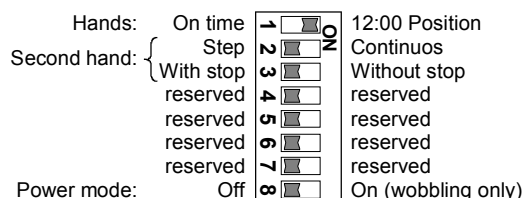


Fig. 5

## 4. Setting up / Connections

- If the 12 o'clock position of the clock is OK, reset DIP Switch **1** to **OFF** position (Fig. 5).
- Wire the line signal (MOBALine) to plug "MBL" (see Fig. 6)
- The hands remain max. 20 seconds in 12 o'clock position, until 2 complete telegrams are received.

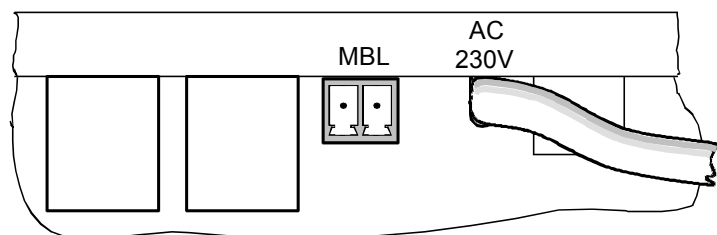


Fig. 6

Example:

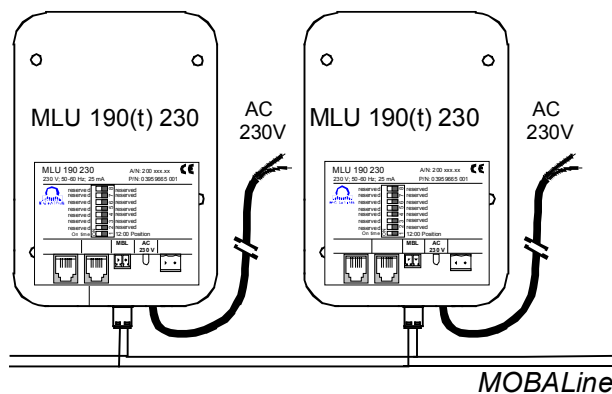


Fig. 7

## 5. Technical specification

	MLU 190 230	MLU 190t 230
Synchronisation	MOBALine	
Setting times:		
Running time to reference pos.	6 minutes maximum	
Read in of time	10 – 20 seconds	
Running time for new adjustment	10 seconds – 6 minutes	
Changes of daylight saving time	5.5 minutes maximum	
Operation mode minute shaft	1 step every 60 s	
Operation mode hour shaft	continuous	
Operation voltage	230 VAC $\pm 10\%$ 50 – 60Hz	
Power consumption:		
from 230 VAC	< 3 VA	
from MOBALine, if mains power is OK	2 mA	
from MOBALine, if mains power is failed	< 10 mA	
Stand-by reserve during power failure	unlimited with MOBALine (hour / minute) / 0 min. (seconds)	
Time keeping with internal quartz clock	unlimited with MOBALine	
Number of motors	1 (hour / min.)	
Dial diameter	25 – 80 cm	
Max. dial thickness	14.5 mm	
Temperature range	-30 ... +70°C	
Weight	380 g	
Standards	EN 50121-4, EN 61000-6-3	
Safety	EN 60950-1, Protection class II	

Subject to change without notice

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**SALES SWITZERLAND**  
MOBATIME SWISS AG

Stettbachstrasse 5 • CH-8600 Dübendorf  
Tel. +41 44 802 75 75 • Fax +41 44 802 75 65  
info-d@mobatime.ch • www.mobatime.ch

MOBATIME SWISS SA  
En Budron H 20 • CH-1052 Le Mont-sur-Lausanne  
Tél. +41 21 654 33 50 • Fax +41 21 654 33 69  
info-f@mobatime.ch • www.mobatime.ch

**SALES WORLDWIDE**

MOSER-BAER SA – EXPORT DIVISION  
19 chemin du Champ-des-Filles • CH-1228 Plan-les-Ouates/GE  
Tel. +41 22 884 96 11 • Fax. +41 22 884 96 90  
export@mobatime.com • www.mobatime.com

**PRODUCTION**

MOSER-BAER AG  
Spitalstrasse 7 • CH-3454 Sumiswald  
Tel. +41 34 432 46 46 • Fax. +41 34 432 46 99  
moserbaer@mobatime.com • www.mobatime.com



**SALES GERMANY, AUSTRIA**

BÜRK MOBATIME GmbH  
Postfach 3760 D-78026 VS-Schwenningen  
Steinkirchring 46 D-78056 VS-Schwenningen  
Telefon +49 7720 8535 - 0 Telefax +49 7720 8535 - 11  
Internet: <http://www.buerk-mobatime.de> E-Mail: buerk@buerk-mobatime.de