INSTRUCTION MANUAL

Wireless Time Distribution

**WTD slave movement
SAW 00 / SEW 00 / SEW 00 MPS**

Manufacturer's Certificate

STANDARDS

The WTD movements were developed and produced in accordance with the EU guidelines.
  2006 / 95 / EG
  89 / 336 / EWG $C \in$
  1999 / 5 / EWG

Notes to the Instruction Manual

1. The information contained in this instruction manual can be changed at any time without prior notice.
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2. This instruction manual was compiled with the utmost care to provide all the details regarding the use
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Contents

1   Introduction

1.1   Description

The WTD movements are self-setting clock movements for indoor clocks up to dial diameter 30 cm with wireless time reception. They are available with hour and minute hands (SAW 00) or hour, minute and second hands (SEW 00 / SEW 00 MPS). The movements SAW 00 and SEW 00 are powered by two type AA / LR6 batteries.

The movement SEW 00 MPS is equipped with a connector and can be powered with a mains power supply.

The WTD movements are adjusted and synchronized automatically from a 868 MHz radio signal per AFNOR standard NFS87-500.

The synchronization takes place from a radio signal transmitter WTD 868-T or a compatible transmitter per AFNOR standard NFS87-500.

The WTD movements can be used in slave clock models **ECO, SLIM-M** and **STANDARD.**
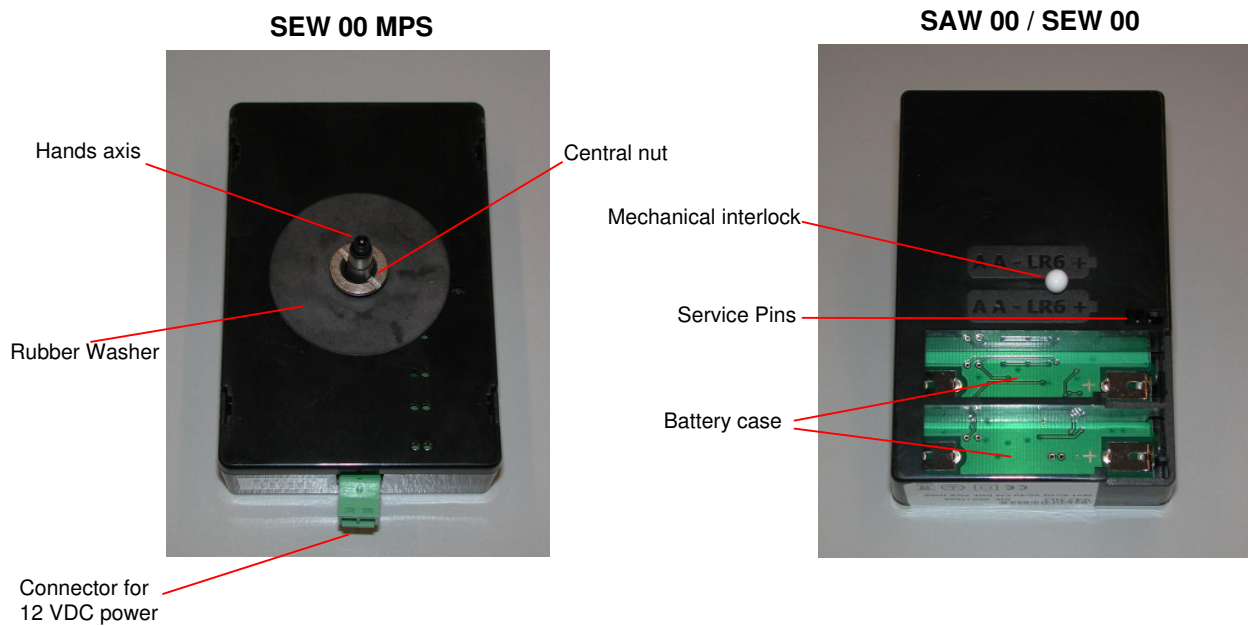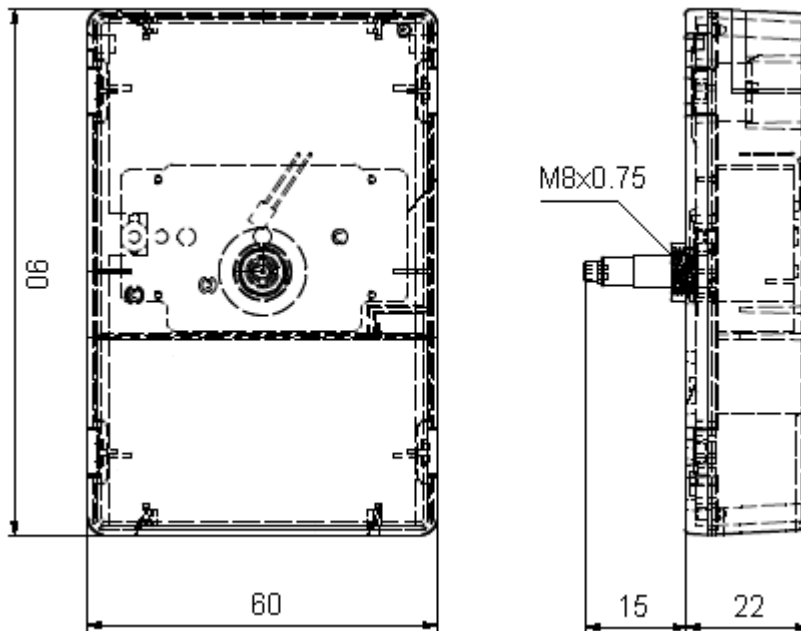
1.2   Product Overview

Wire less time distribution product range.

Art. No.	Designation	Description
203051	WTD 868-RS	Monitor wireless receiver Interface
202841	WTD 868-RM	MOBALine wireless receiver interface
202842	WTD 868-RD	DCF wireless receiver interface
202606	WTD 868-T	Time signal radio transmitter
701182	WTD Repeater	Time signal radio repeater
701143	WTD 868-T MPS	Mains power unit for WTD 868-T
701263	SEW 00	Movement for hour, minute & second display, battery powered (2xAA)
701272	SAW 00	Movement for hour & minute display, battery powered (2xAA)
203164	SEW 00 MPS	Movement for hour, minute & second display, mains powered (80..250 V 50/60 Hz), IMPS 12 included
701372	IMPS 12	Mains power unit for SEW 00 MPS movement (110..240 V 50/60 Hz ➜ 12VDC)
701373	IMPS 24	Mains power unit for WTD 868-RM / -RD (110..240 V 50/60 Hz ➜ 24VDC)

2   Hardware Description

2.1   Dimensions, Definitions

SEW 00 MPS   **SAW 00 / SEW 00**

Hands axis

Central nut

Mechanical interlock

Service Pins

Rubber Washer

Battery case

Connector for
12 VDC power

2.2   Service Pins

The service pins can be short-circuited to set movement to 12 o'clock position (see chapter 5.1) or to enter the two initial modes (see chapter 3.1).

2.3   Battery case (SAW 00 / SEW 00)

The Battery case is made for two 1.5V type AA – LR6 batteries.
Take care on the polarity which is shown above the battery case.

2.4   DC Power supply (SEW 00 MPS)

Connector for two wires with screw terminals.

Input voltage: 6..20 VDC
Consumption: 5mA@20 VDC or 15mA@6 VDC
Polarity: independent

2.5   Central nut / washer / torque for fixation

The WTD movements are mounted on clock dial by means of a central nut (M8x0.75; max. torque for fixation 135 Ncm). The washer, made from ribbed rubber, is placed on the back side of the clock dial to prevent a rotation of the movement from its original mounting position.

2.6   Mechanical locking

At delivery each movement is mechanically locked with a small pin at 12:00 position.

The pin must not be removed before the movement is assembled into the clock case and the hands are correctly mounted at 12:00 position.

To plug in the pin again (e.g. for repair reasons), the movement has to be set to 12:00 position. When clock hands stopped running, the pin can be plugged in carefully (see chapter 5.1).

Warning: To prevent damages, the pin has to be removed before the commissioning of the movement (movement powered on).

Remark: In case you get complete clocks, the hands are already correctly mounted at 12:00 position and usually the pin was already removed after assembly.

2.7   Hand sets / accessories

For the WTD movement SAW 00 / SEW 00 / SEW 00 MPS the following accessories are available:

Position:	Descriptive name:	Part number:
1	Central nut M8x0.75	700 956
2	Rubber washer Ø 40 x 12.5 x 0.5 mm If needed (depending on dial thickness): Rubber washer Ø 40 x 12.5 x 1 mm Rubber washer Ø 43 x 12.5 x 2 mm	32 002 250 079 250 078
3	Hour hand Ø 25 cm	202 793
4	Minute hand Ø 25 cm	202 802
5	Second hand Ø 25 cm	250 446
6	Hour hand Ø 30 cm	203 228
7	Minute hand Ø 30 cm	203 229
8	Second hand needle Ø 30	250 446
9	Second hand bar Ø 30	250 447

Remark: It is strongly recommended to use no other accessories than the originals listed above. Hands, which do not fit our specification, could influence the correct function of the movement or even damage the movement.

3   Synchronization

The SEW 00 (MPS) and SAW 00 radio clock movements synchronize themselves via a time signal from a local radio transmitter in the 868 MHz frequency band (WTD 868-T). The radio clock movements have **two initial modes** that are fundamental to initial use.

3.1   Initial Modes

To enter one of the initial modes, the service pins has to be short-circuited for a certain time.
The current mode is displayed with the blinking frequency of the yellow LED next to the service pins.

Mode	Mode selection: Service pins short-circuit time	Mode display: Yellow LED	Description
QUICK INIT	**<= 1 second**	Blinking rapidly (3 times per second)	The movements synchronize using **any transmitter** in the footprint and thereafter using only that transmitter.
INIT	**> 3 seconds**	Blinking every second	The movements synchronize to a single transmitter in the footprint that is also in **initial mode** and thereafter using only that transmitter. (Transmitter settings WTD 868-T, see BE-800490 manual)

3.2   Transmitter address, Movement address

Movements are initialised in factory with **address 1**. To simplify commissioning, you set the transmitter address to address 1 too. Otherwise each movement has to be set to init mode first.

After the initialisation the movements permanently store the **transmitter address** included in the time telegram and thereafter only accept telegrams from that transmitter address.

Installation changes (e.g. transmitter address changes) may result in the clocks having to be returned to their **initial mode**.

Important: In installations with several time signal transmitters make sure that each transmitter has a **different address** (different send period).

Recommendation: Only addresses 0..10 should be used, because the send periodicity is depending from address (see manual BE-800490, WTD 868-T).
Too high send periodicity may result in reception problems.

3.3 Synchronization interval, Battery life time

SEW 00 MPS:
Clocks with mains power receive the time signal constantly.

SAW 00 / SEW 00:
Battery powered movements receive the signal once every hour for max. **15 seconds** to ensure a long battery service life.

Battery life time (AA – LR6 only Alkaline types):
SAW 00: typical > 3 years
SEW 00: typical > 2 years

3.4 Synchronization failure

Without synchronization the movement continues running on internal quartz base for 24 hours, afterwards the clock runs to 12 o'clock position.

Behavior on 12 o'clock position:
SEW 00 MPS:
Movement tries to receive time message permanently

SAW 00 / SEW 00:
Synchronized from a low transmitter address (0..10): reception every hour for 15 sec.
Synchronized from a high transmitter address (11..16): reception every 4 hours for 4 hours max.

3.5 Accuracy

The time deviation is lower than +/-100 ms as long as the clock is synchronized.

3.6 Status LED

The "Waiting INIT" mode does not occur with movements SEW 00 MPS, because reception is permanently switched on.

LED	Mode	Description
Off	OK	Normal operation
Blinking rapidly (3 times per second)	QUICK INIT	The movements synchronize using **any transmitter** in the footprint and thereafter using only that transmitter.
Blinking every second	INIT	The movements synchronize to a single transmitter in the footprint that is also in **initial mode** and thereafter using only that transmitter. (Transmitter settings WTD 868-T, see BE-800490 manual)
Blinking every 3 seconds	Waiting INIT	The clock never received a telegram from a transmitter in INIT mode for 4 hours after installation. Reception is switched off to save battery power. Reset the movement by removing the batteries or short-circuit the service pins for 3 seconds.

4 Commissioning

⚠️ **Important:** The movements can be mechanically locked at 12 o'clock position using a pin. The pin must be carefully removed before inserting the batteries or connecting to mains power.

4.1 Step by step procedure

1 Mount clock movement on the dial using the central nut (max. torque 135 Ncm) (see chapter 2.5).
2 Mount clock hands (12 o'clock position)
3 Carefully remove the mechanical locking (needle) from the movement (see chapter 2.6).
4 Connect power or insert batteries (clock runs to a fix position - 04:00, 08:00 or 12:00 and stops).
5 Set the movement to the desired initial mode (see chapter 3.1).
6 Once it has received a valid time signal it will automatically adjust to the correct time.

5 Maintenance

It may be necessary to set the clock hands to the 12 o'clock position for maintenance (e.g. to check hand position or mount new hands). Procedure:

5.1 Run hands to 12 o'clock position and mount hands

1 Remove the batteries / mains power supply.
2 Permanently short-circuit the service pins on the back of the movement with a jumper (bridge).
3 Reinsert the batteries / connect mains power supply.
4 Wait until the clock stops (at least 10 seconds without moving). This is effectively the 12 o'clock position.
5 Carefully insert the pin supplied with the movement (prevents the axes from being manually moved during the hands mounting).
6 Mount hands to 12 o'clock position.
7 Carefully remove the pin from the movement.
8 Remove the jumper from the service pins.
9 Proceed as given in chapter 4 "Commissioning", starting from step 4.
10 The hands must not touch the dial, the cover glass or the other hands.

6   Technical Data

6.1   Overview

Hands:	Hour hand: Length ≤ 130 mm, weight ≤ 2.5 g, unbalanced mass ≤ 0.6 mNm Minute: Length ≤ 160 mm, weight ≤ 2.5 g, unbalanced mass ≤ 0.8 mNm Second (only SEN 00): Length ≤ 130 mm, weight ≤ 1 g, unbalanced mass ≤ 0.1 mNm
Radio receiver:	Centre frequency: 869.525 MHz Bandwidth: 100 kHz Modulation: FSK, +/− 25 kHz
Micro controller:	8 bit Single-Chip FLASH-Processor.
Controls:	2 service pins 1 LED, yellow (mode)
Synchronization:	Radio signal transmitter according to AFNOR NF 587-500 (e. g. WTD 868-T)
Accuracy:	+/−100 ms (synchronized)
Time keeping:	Autonomous operation on quartz basis over 24 h
Power supply:	SEW 00, SAW 00: 2x AA −LR6 batterie (Alkaline) SEW 00 MPS: 6..20 VDC, 100 mW
Temperature range:	0..50 °C, 10-90 % relative humidity, without condensation
Casing:	Plastic case (polycarbonate), black, in two parts
Dimensions:	approx. 90 x 60 x 22 mm (l x w x h), weight ca. 100 g