		V 3112

OIML Member State	**OIML Certificate No.**
Czech Republic	R49/2013-A-CZ1-24.07

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: Czech Metrology Institute
Address: Okružní 31, 638 00 Brno, Czech Republic

Person responsible: Jan Kalandra

Applicant

Name: MEMF ELECTRICAL INDUSTRIES Co.
Address: Second Industrial Area, Street 179, PO Box. 355989
Riyadh, PC: 11383, Kingdom of Saudi Arabia

Manufacturer

Name: MEMF ELECTRICAL INDUSTRIES Co.
Address: Second Industrial Area, Street 179, PO Box. 355989
Riyadh, PC: 11383, Kingdom of Saudi Arabia

Identification of the certified type *(the detailed characteristics will be defined in the additional pages)*

water meter - ultrasonic
type MFW, Temperature class: T50; accuracy class 2

Designation of the module *(if applicable)*

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This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49 Edition (year): 2013

For accuracy class (if applicable): 2

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated OIML type evaluation report:

- No. 0511-ER-V108-22 dated 16 December 2024 that includes 40 pages including annex 1
- OIML Test report No. 6015-PT-P5011-24 that includes 47 pages including annex 1, annex 2
- Test report No. 6011-PT-SW006-24 that includes 3 pages

The technical documentation relating to the identified type is contained in documentation file:

0511-UL-V108-22

OIML Certificate History

Revision No.	Date	Description of the modification
-	18 December 2024	Issuing certificate

The OIML Issuing Authority
RNDr. Pavel Klenovský
Head of Certification Body

Date: 18 December 2024

Český metrologický institut
-3-

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.

Measuring system description

The water meters type MFW are designed to measure, memorise and display the volume at metering conditions of water passing through the measurement transducer in the sense of OIML R:49:2013.
The water meters type MFW consist of a plastic body with screw threads, a pair of ultrasonic transducers and the electronic indicating device. The electronic indicating device is formed by an LCD display. The matching magnetic rod can be used to touch the magnetic induction area on the panel for operation to switch the display content. Operation and display consists of 4 menus (common information during normal use - Figure 3, fault display-E, information-I and detection-F). The display shows the delivered volume for forward flow as default.
The water meters type MFW working principle is to use the ultrasonic propagation speed in the fluid with the flow rate changes to measure the flow. Specifically, ultrasonic water meter by transmitting ultrasonic pulses, and then measure the propagation speed of these ultrasonic pulses in the fluid, through the measurement of ultrasonic propagation time and distance in the fluid to calculate the flow rate.
The water meters type MFW are powered by a permanent battery with voltage 3.6 V and lifetime 12 years. The water meters shall be installed to H↑ horizontal position with the indicating device at the top.

Marking and inscriptions

The water meters types MFW shall be clearly and indelibly marked with the following information:

- Water meter type
- Unit of measurement (m3)
- Numerical value Q3 in m3/h (Q3 ×.×) and the ratio Q3 / Q1,
- Manufacturer´s name, registered trade name or registered trade mark
- Year of manufacture, two last digits of the year of manufacture, or the month and year of manufacture
- Serial number (as near as possible to the indicating device)
- Direction of flow, by means of an arrow (on display)
- Maximum admissible pressure (MAP ××)
- The temperature class (T××)
- The pressure loss class (Δp ××)
- The installation sensitivity class (Ux Dx)
- Power voltage
- Environmental classification
- Electromagnetic environmental class
- Software version
- Hardware version
- Type approval sign according to national regulations
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These markings shall comply with the requirements of OIML R 49 and shall be visible without dismantling the water meter after the instrument has been placed on the market or put into use. Example is in Figure 2.

Characteristics

Basic technical data of water meters types MFW:

Manufacturer:	MEMF ELECTRICAL INDUSTRIES Co.	
Model name:	MFW	
Nominal diameter:	*15*	*20*
Type details:		
Q_1 [m³/h]:	0.00625	0.01
Q_2 [m³/h]:	0.01	0.016
Q_3 [m3/h]:	2.5	4

Q_4 [m^3/h]:	3.125	5
Q_3/Q_1:	400	
Q_2/Q_1:	1.6	
Q_4/Q_3:	1.25	
Measuring principle:	ultrasonic	
Accuracy class:	2	
Maximum permissible error for the lower flowrate zone (MPE_l):	±5 %	
Maximum permissible error for the upper flowrate zone (MPE_u):	±2 %	
Temperature class:	T50	
Water pressure class:	MAP16	
Pressure loss class:	*Δp63*	
Reverse flow:	*Not designed to measure*	
Environmental class/temperature limits:	*O/ (-25 °C to 70) °C*	
Electromagnetic environment:	*E1/E2*	
Maximum admissible temperature [°C]:	50	
Maximum admissible pressure [MPa]:	1.6	
Orientation limitation:	Horizontal with the dial up	
Indicating range – testing mode/user mode [m^3]:	*9 999 999 / 99999.999*	
Resolution of the indicating device testing mode/user mode [m^3]:	*0.001 /0.000001*	
Resolution of the device for rapid testing [pulse/dm^3]:	*N/A*	
Resolution of the indicating device for rapid testing [m^3]:	*N/A*	
EUT testing requirements (OIML R 49-2:2013, 8.1.8):		
Category:	B	
Case:	B	
Installation details:		
Connection type (screw thread):	G¾"B	G1"B
Minimum straight length of inlet pipe [mm]:	5	
Minimum straight length of outlet pipe [mm]:	3	
Flow profile sensitivity class:	*U5D3*	
Flow conditioner (details if required):	No	
Mounting:	-	
Orientation:	Horizontal with the dial up	
Other relevant information:	-	
Length [mm]:	*110*	*130*
Reed switch power supply (U_{max} / I_{max}):	-	
Reed switch K-factor (impulse / L):	-	
Installation details (electrical):		

Wiring instructions:	-
Mounting arrangement:	-
Orientation limitations:	-
Power supply:	
Type (battery, mains AC, mains DC):	Battery
U_{max} (V):	3.6
U_{min} (V):	1.9
Frequency:	-
Minimum battery life time [years]:	12 years
Software version (of legally relevant SW):	441348A
CRC checksum (of legally relevant SW):	D8B8 (CRC-16)
Ancillary devices (not certified):	
Reed sensor power supply (U_{max} / I_{max}):	Reed sensor
Type	max. 48 V DC / AC / 50 mA
Power supply (U_{max} / I_{max})^2:	Inductive sensor
K-factor [pulse/Litres]:	max. 24 V DC / 20 mA
Reed sensor power supply (U_{max} / I_{max}):	programmed electronically
Further information specified by the manufacture (not certified)	
Protection class	IP68

Securing components and verification marks

The MFW meters have to be sealed by connecting two plastic rings between the two-parts plastic cover using a wire with a lead seal without damaging the seal or the sealing wire. The location of the seal is described in Figure 1.

Figure 1: The water meter type MFW – view and sealing, example of register:

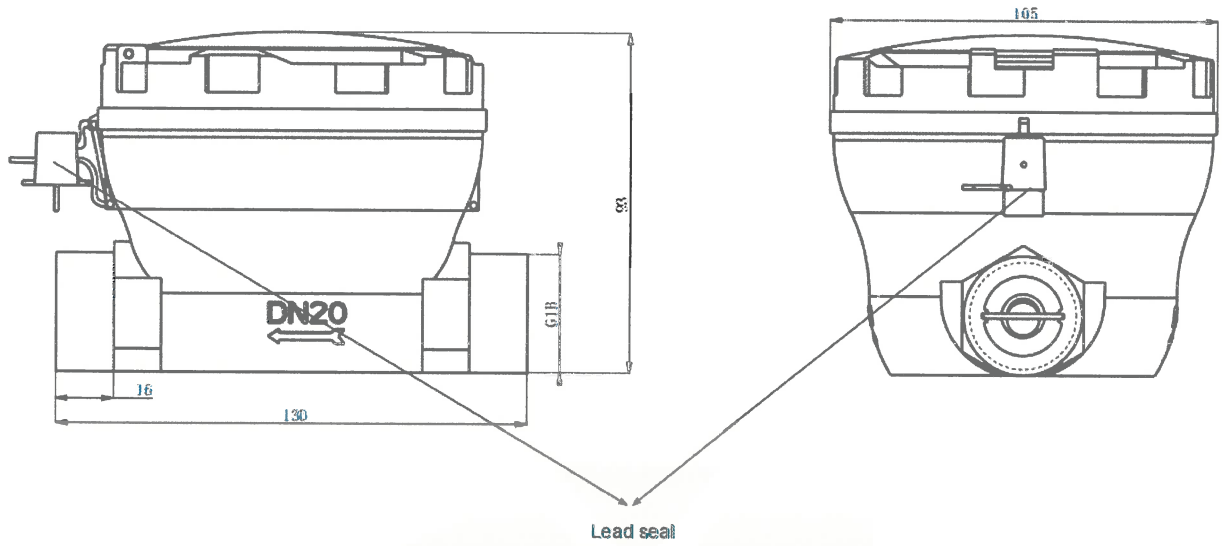


Figure 2: The water meter type MFW – marking, example of register DN15 and DN20:

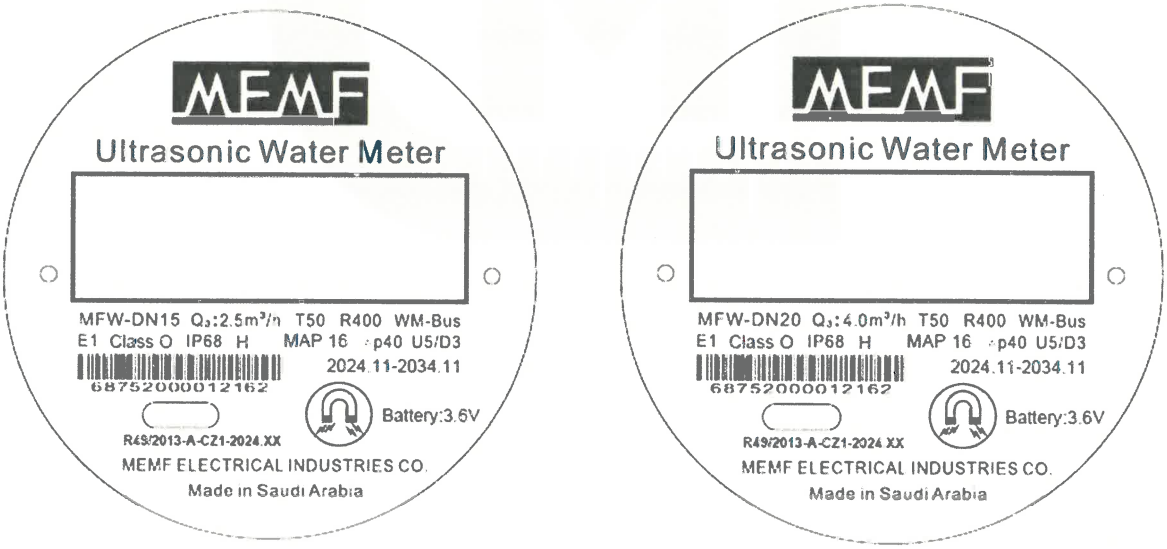
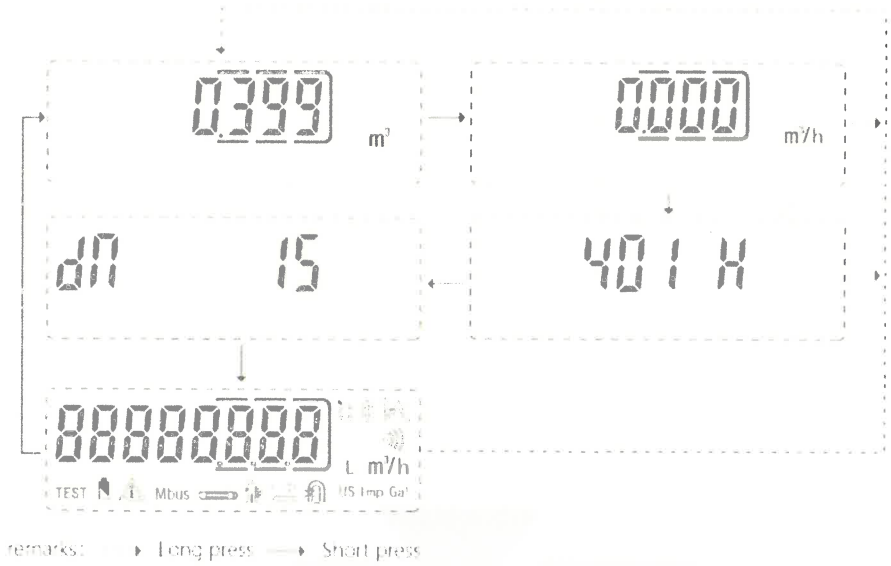


Figure 3: The water meter type MFW – example of common display menu:



The parameters corresponding to the menus in the above figure are as follows:

1. Cumulative flow
2. Instantaneous flow
3. Cumulative working time (hours)
4. Diameter specification
5. Full screen display