



Member state
Czech Republic

OIML Certificate No.
R49/2006-CZ-14.02
Revision 1

OIML CERTIFICATE OF CONFORMITY

Issuing Authority

Name: Czech Metrology Institute
Address: Okružní 31,
638 00 Brno, CZ
Person responsible: Jan Kalandra

Applicant

Name: PFGROUP FLOWMETER (LEI)
Address: 256, Boulevard Ba Hmad
20300 Casablanca
Marocco

Manufacturer of the certified type

Name: Ningbo Water Meter Co., Ltd.
Address: No. 99, Lane 268, Beihai Road
Ningbo 315032
China

Identification of the certified type

Woltman water meter
Type: TURBO OPTIMA

Further characteristics see page 3 and 4

This certificate attests the conformity of above identified type (represented by the sample or samples identified in the associated test report) with the requirements of the following Recommendation(s) of the International Organization of Legal Metrology (OIML):

R 49, edition 2006, for accuracy class 2

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This certificate relates only to the metrological and technical characteristics of the type of instrument covered by the relevant OIML Recommendation(s) identified above.

This 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 Test report: No. 6015-PT-P3007-14 that includes 2 pages and No. 6015-PT-A0040-10 that includes 88 pages.

Measuring system description:

The water meters type TURBO OPTIMA consist of a iron, brass or bronze casted body with connecting flanges or groove connection, a interchangeable wet measuring unit with adjusting device and a dry mechanical indicating device or super dry mechanical indicating device (Copper Can Calculator). There is water meter flange cover connecting by screws and sealed by silicon o-ring on the measuring unit.

The measuring unit consist of a inlet flow straightner with stainless steel shaft with tungsten carbide end, a plastic turbine with two composite axial bearings and two radial sapphire bearings, an outlet flow straightner with stainless steel shaft with tungsten carbide end, a transmission shaft with a magnetic coupling formed by two or four cube shape magnets protected by shaft tube, water meter flange cover, an adjusting screw sealed by silicon o-ring with adjusting slide, a dry indicating device (Plastic or Copper Can Calculator), plastic cup with rotary plate, bracket with cupper can or plastic register, plastic sealed ring with plastic cover.

The water meters type TURBO OPTIMA are equipped with a dry (Plastic Calculator) or super dry (Copper Can Calculator) indicating device.



The Issuing Authority
Jan Kalandra

17 March 2015



The CIML Member
Pavel Klenovský

17 March 2015

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 the associated test report is not permitted although either may be reproduced in full.

Characteristics:

The water meters type TURBO OPTIMA are horizontal Woltman meter.

Nominal diameter (DN) [mm]:	40	50	65	80	100	125
Overload flowrate (Q_4) [m^3/h]:	≤ 31.3	≤ 50.0	≤ 78.8	≤ 78.8	≤ 125	≤ 200
Permanent flowrate (Q_3) [m^3/h]:	$\leq 25.0^1$	$\leq 40.0^1$	$\leq 63.0^1$	$\leq 63.0^1$	$\leq 100^1$	$\leq 160^1$
Transitional flowrate (Q_2) [m^3/h]:	≥ 0.800	≥ 0.800	≥ 1.26	≥ 1.26	≥ 2.00	≥ 3.20
Minimum flowrate (Q_1) [m^3/h]:	≥ 0.500	≥ 0.500	≥ 0.788	≥ 0.788	≥ 1.25	≥ 2.00
Ratio Q_3 / Q_1 :	$\leq 50^2$	$\leq 80^2$				
Ratio Q_2 / Q_1 :	1.6					
Ratio Q_4 / Q_3 :	1.25					
Accuracy class:	2					
Maximum permissible error for the lower flowrate zone (MPE _l):	$\pm 5\%$					
Maximum permissible error for the upper flowrate zone (MPE _u):	$\pm 2\%$ for water having a temperature $\leq 30\text{ }^\circ\text{C}$ $\pm 3\%$ for water having a temperature $> 30\text{ }^\circ\text{C}$					
Temperature class:	T30 and T50					
Water pressure classes:	MAP 16					
Pressure-loss classes:	$\Delta P 10$	$\Delta P 16$	$\Delta P 10$	$\Delta P 10$	$\Delta P 10$	$\Delta P 16$
Indicating range (6+2) [m^3]:	999 999					
Resolution of the indicating device [m^3]:	0.001					
Indicating range (6+2+1) [m^3]:	999 999					
Resolution of the indicating device [m^3]:	0.0005					
Indicating range (6+3) [m^3]:	999 999					
Resolution of the indicating device [m^3]:	0.0005					
Resolution of the device for the rapid testing [pulse/L]:	1.093	1.093	0.5814	0.5814	0.3825	0.306
Flow profile sensitivity classes:	U10 D5					
Orientation limitation:	V and H					
Minimum length L [mm]:	260	200	200	200	250	250
Maximum length L [mm]:	300	335	260	413	483	250
Connection type:	Flange or Groove Connection					
Reed switch power supply (U_{max} / I_{max}):	max. 24 V / 0.01 A					
Reed switch K-factor [impulse / L]:	0.1, 0.01 and 0.001					

¹ The value of Q_3 shall be chosen from the R5 line of ISO 3:1973.

² The ratio Q_3 / Q_1 shall be chosen from the R10 line from ISO 3:1973 and this value shall be higher than 10.

Nominal diameter (DN) [mm]:	150	200	250	300	350
Overload flowrate (Q_4) [m^3/h]:	≤ 313	≤ 500	≤ 788	≤ 1250	≤ 1251
Permanent flowrate (Q_3) [m^3/h]:	$\leq 250^1$	$\leq 400^1$	$\leq 630^1$	$\leq 1000^1$	$\leq 1000^1$
Transitional flowrate (Q_2) [m^3/h]:	≥ 5.00	≥ 8.00	≥ 12.6	≥ 20.0	≥ 20.0
Minimum flowrate (Q_1) [m^3/h]:	≥ 3.13	≥ 5.00	≥ 7.88	≥ 12.5	≥ 12.5
Ratio Q_3 / Q_1 :	$\leq 80^2$				
Ratio Q_2 / Q_1 :	1.6				
Ratio Q_4 / Q_3 :	1.25				
Accuracy class:	2				
Maximum permissible error for the lower flowrate zone (MPE _l):	$\pm 5\%$				
Maximum permissible error for the upper flowrate zone (MPE _u):	$\pm 2\%$ for water having a temperature $\leq 30\text{ }^\circ\text{C}$ $\pm 3\%$ for water having a temperature $> 30\text{ }^\circ\text{C}$				

Temperature class:	T30 and T50				
Water pressure classes:	MAP 16				
Pressure-loss classes:	ΔP 10	ΔP 10	ΔP 10	ΔP 10	ΔP 10
Indicating range (6+2) [m ³]:	9 999 999				
Resolution of the indicating device [m ³]:	0.01				
Indicating range (6+2+1) [m ³]:	9 999 999		99 999 999		
Resolution of the indicating device [m ³]:	0.005		0.05		
Indicating range (6+3) [m ³]:	9 999 999		99 999 999		
Resolution of the indicating device [m ³]:	0.005		0.05		
Resolution of the device for the rapid testing [pulse/L]:	0.06442	0.04073	0.01377	0.01122	0.01122
Flow profile sensitivity classes:	U10 D5				
Orientation limitation:	V and H				
Minimum length L [mm]:	300	350	450	500	500
Maximum length L [mm]:	560	508	450	500	500
Connection type:	Flange or Groove Connection				
Reed switch power supply (U_{max} / I_{max}):	max. 24 V / 0.01 A				
Reed switch K-factor [impulse / L]:	0.01, 0.001 and 0.0001				

¹ The value of Q_3 shall be chosen from the R5 line of ISO 3:1973.

² The ratio Q_3 / Q_1 shall be chosen from the R10 line from ISO 3:1973 and this value shall be higher than 10.

Nominal diameter (DN) [mm]:	400	500
Overload flowrate (Q_4) [m ³ /h]:	≤ 2000	≤ 3125
Permanent flowrate (Q_3) [m ³ /h]:	≤ 1600 ¹	≤ 2500 ¹
Transitional flowrate (Q_2) [m ³ /h]:	≥ 32.0	≥ 50.0
Minimum flowrate (Q_1) [m ³ /h]:	≥ 20.0	≥ 31.3
Ratio Q_3 / Q_1 :	≤ 80 ²	
Ratio Q_2 / Q_1 :	1.6	
Ratio Q_4 / Q_3 :	1.25	
Accuracy class:	2	
Maximum permissible error for the lower flowrate zone (MPE _l):	$\pm 5\%$	
Maximum permissible error for the upper flowrate zone (MPE _u):	$\pm 2\%$ for water having a temperature $\leq 30\text{ }^\circ\text{C}$ $\pm 3\%$ for water having a temperature $> 30\text{ }^\circ\text{C}$	
Temperature class:	T30 and T50	
Water pressure classes:	MAP 16	
Pressure-loss classes:	ΔP 10	ΔP 10
Indicating range (6+2) [m ³]:	99 999 999	
Resolution of the indicating device [m ³]:	0.1	
Indicating range (6+2+1) [m ³]:	99 999 999	
Resolution of the indicating device [m ³]:	0.05	
Indicating range (6+3) [m ³]:		
Resolution of the indicating device [m ³]:	0.05	
Resolution of the device for the rapid testing [pulse/L]:	0.006190	0.003702
Flow profile sensitivity classes:	U10 D5	
Orientation limitation:	V and H	
Minimum length L [mm]:	500	500
Maximum length L [mm]:	600	800
Connection type:	Flange or Groove Connection	
Reed switch power supply (U_{max} / I_{max}):	max. 24 V / 0.01 A	
Reed switch K-factor [impulse / L]:	0.001, 0.0001 and 0.00001	

¹ The value of Q_3 shall be chosen from the R5 line of ISO 3:1973.

² The ratio Q_3 / Q_1 shall be chosen from the R10 line from ISO 3:1973 and this value shall be higher than 10.