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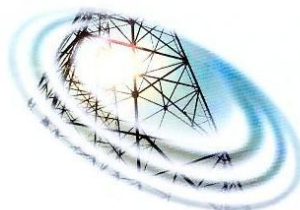
**Protection Relay Ref. Lab.**

**Client:** ZILUG Co.

**Applicant / Manufacturer:** ZILUG Co.

**Product Name:** Multifunction Power Meter, Data Logger

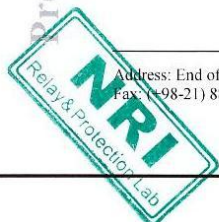
**Model:** ZMP 8800



**Reference laboratories Center**

**T&D Research Center**

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## 1-Abstract of test results

Row	Test	Lab.	Sub clause/Std.	Result
1	<b>Tests of accuracy requirements</b>		8(62053-21)	
1-2	Test of variation of the current	NRI	8.1(62053-21)	pass
2	<b>Tests of electromagnetic compatibility (EMC)</b>		7.5(62052-11)	
2-1	Test of immunity to electrostatic discharge	NRI	7.5.2(62052-11)	pass

**NRI**

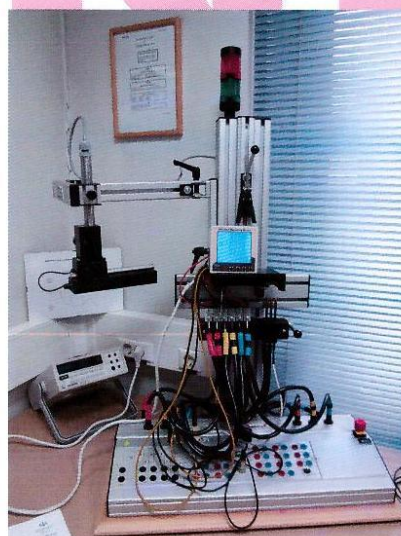


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## 2- Marking Plate



marking plate of meter



Accuracy Test setup



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### 3- Technical specifications of the samples

-Manufacturer: Zilug Co

-Accuracy class: Active 0.2s/Reactive 0.2s

Nominal input Current:	5 A+ 20 % OL
Nominal Input voltage:	3*230V (L-N)(0-480V L-L)
Power Supply:	230 V AC
Working Frequency:	45-65Hz
Active Energy Meter accuracy Class:	0.2s
Reactive Energy Meter accuracy Class:*	0.2s

\* Recommended accuracy classes for reactive energy meter according to the table 6 of the IEC 62053-23 are 2 & 3, but here according to manufacturer declaration the test is performed in regulation of 0.2 s active energy meter requirements.



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#### 4- Remarks:

This report is valid for 2 years. The Client has a right to send his/her official and written claim against the results or the test method within one month after issuing the test results; if any mistake has occurred by the laboratory which has influenced on test results, re-testing would be done with no charge. Tested samples will be kept by the laboratory for 6 months after the test; otherwise, no client claim will be accepted.

#### 5 – Summary of tests

NRI



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### 5-1- current Variation test(accuracy test)

The test was carried out in accordance with clause 8.1 of IEC62053-22,23. The values for the errors registered at different currents and various values for  $\cos \Phi$ , at reference voltage and reference frequency, can be found in below. Test conditions and result are shown in table .

**test condition and result of current variation**

Standard	IEC 62053-22,23
Sample Code/ Serial No.	STR92004/ZMP88 92-0002
Equipment	Zera-ED8349
<b>Result</b>	<b>Pass</b> <input checked="" type="checkbox"/>



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## IEC62053-22(Active)

Table 4 – Percentage error limits  
 (single-phase meters and polyphase meters with balanced loads)

Value of current	Power factor	Percentage error limits for meters of class	
		0,2 S	0,5 S
$0,01 I_n \leq I < 0,05 I_n$	1	$\pm 0,4$	$\pm 1,0$
$0,05 I_n \leq I \leq I_{max}$	1	$\pm 0,2$	$\pm 0,5$
$0,02 I_n \leq I < 0,1 I_n$	0,5 inductive	$\pm 0,5$	$\pm 1,0$
	0,8 capacitive	$\pm 0,5$	$\pm 1,0$
$0,1 I_n \leq I \leq I_{max}$	0,5 inductive	$\pm 0,3$	$\pm 0,6$
	0,8 capacitive	$\pm 0,3$	$\pm 0,6$
When specially requested by the user: from $0,1 I_n \leq I \leq I_{max}$	0,25 inductive	$\pm 0,5$	$\pm 1,0$
	0,5 capacitive	$\pm 0,5$	$\pm 1,0$

## Active (IEC62053-22)

Limits	Value of current	Power factor	Measured Error	Percentage error for class 0.2s
$0.01I_n \leq I < 0.05I_n$	0.05A	1	0.22	$\pm 0.4$
	0.15A	1	0.18	
$0.05I_n \leq I \leq I_{max}$	0.25A	1	-0.08	$\pm 0.2$
	5A	1	0.05	
	6A	1	0.04	
$0.02I_n \leq I < 0.1I_n$	0.10A	0.5 ind	0.40	$\pm 0.5$
	0.25A	0.5 ind	0.24	
	0.10A	0.8 cap	0.08	
	0.25A	0.8 cap	-0.13	
$0.1I_n \leq I \leq I_{max}$	0.5A	0.5 ind	0.12	$\pm 0.3$
	5A	0.5 ind	-0.06	
	6A	0.5 ind	-0.04	
	0.5A	0.8 cap	-0.04	
	5A	0.8 cap	0.08	
	6A	0.8 cap	0.11	
$0.1I_n \leq I \leq I_{max}$	5A	0.25 ind	0.01	$\pm 0.5$
	6A	0.25 ind	-0.27	
	0.5A	0.5 cap	-0.09	
	5A	0.5 cap	0.16	
	6A	0.5 cap	0.2	



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### IEC62053-23(Reactive)

Table 6 – Percentage error limits  
(single-phase meters and polyphase meters with balanced loads)

Value of current		sinφ (inductive or capacitive)	Percentage error limits for meters of class	
for direct connected meters	for transformer operated meters		2	3
$0,05 I_b \leq I < 0,1 I_b$	$0,02 I_n \leq I < 0,05 I_n$	1	±2,5	±4,0
$0,1 I_b \leq I \leq I_{max}$	$0,05 I_n \leq I \leq I_{max}$	1	±2,0	±3,0
$0,1 I_b \leq I < 0,2 I_b$	$0,05 I_n \leq I < 0,1 I_n$	0,5	±2,5	±4,0
$0,2 I_b \leq I \leq I_{max}$	$0,1 I_n \leq I \leq I_{max}$	0,5	±2,0	±3,0
$0,2 I_b \leq I \leq I_{max}$	$0,1 I_n \leq I \leq I_{max}$	0,25	±2,5	±4,0

### Reactive (IEC62053-23)

Limits	Value of current	sinφ	Measured Error	Percentage error for class 0.2s
$0,05 I_b \leq I < 0,1 I_b$	0.25A	1	-0.01	±0.25
	0.40A	1	-0.02	
$0,1 I_b \leq I \leq I_{max}$	0.5A	1	0.03	±0.20
	5A	1	0.01	
	6A	1	0.01	
$0,1 I_b \leq I < 0,2 I_b$	0.5A	0.5	-0.09	±0.25
	0.75A	0.5	-0.10	
$0,2 I_b \leq I \leq I_{max}$	0.5A	0.5	-0.11	±0.20
	5A	0.5	0.15	
	6A	0.5	0.18	
$0,2 I_b \leq I \leq I_{max}$	0.5A	0.25	-0.25	±0.25
	5A	0.25	0.25	
	6A	0.25	0.25	



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## 5-2 - Test of immunity to electrostatic discharge

This test was carried out in accordance with clause 7.5.2 of IEC62052-11 and IEC610004-2. Test conditions and results are shown in table below.

### test condition and result of immunity to ESD

Standard	IEC 62052-11- IEC61000-4-2						
Sample Code/ Serial No.	STR93004/ZMP 88 92-0002						
Equipment	Haefely, PESD 1610						
Acceptance criteria	Change in registers < X unit Change in test output ≤ X unit			$X \leq 10^{-6} mU_n I_{max}$			
Test condition							
Voltage	Current	Test voltage			Number of discharge	Polarity	
		Contact discharge (Indirect)		Air discharge			
Reference voltage	Open circuit	4 kV		8 kV		10	+/-
		Result	Pass☑	Result	Pass☑		
Result		Pass☑					



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## Test Configuration

- Accuracy and Electrical Tests



- ESD Test

