

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 1 of 8

Test report of samples "Powermeters Series PM130"

List of samples

Manufacturer	Type	Serial number	Reference voltage, V	Rated (maximum) current, A	Reference frequency, Hz
SATEC	PM130EH	503946 503943	3 x 120	3 x 5(6)	50

List of reference equipment

I.D. number	Manufacturer	Type
7/4112	ZERA	TPZ 303
7/5146	LANDIS & GYR	ETALOGYR 1002
7/5131	ZERA	COM 303-3
7/5130	ZERA	MTS 320 PZ
7/4539	SCHAFNER	NS 600
7/4342	F.W.BELL	9500
7/4009	RB	UH 28 M
7/5282	VOTSCH	VCL 4034 MH
7/3671	ZERA	51-548-1
7/5088	SCHLUMBERGER	GP3050/3
K2251/19	BEHA	UNITEST

List of performed tests

Number of item in IEC62053-21	Number of item in IEC62052-11	Test	Number of test
8.1	-	Error due to variation of the current	1.
8.2	-	Error due to ambient temperature variation	2.
8.2	-	Error due to voltage variation	3.
8.2	-	Error due to frequency variation	4.
8.2	-	Error due to reversed phase sequence	5.
8.2	-	Error due to voltage unbalance	6.
8.2.1	-	Error due to harmonic components in the current and voltage circuit	7.
8.2.3	-	Error due to magnetic indication of external origin 0.5 mT	8.
8.2	7.5.4	Error due to fast transient bust	9.
8.3.1	-	Test of initial start-up of the meter	10.
7.4	7.3.3	AC voltage test	11.

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 2 of 8

TEST RESULTS

1. Error due to variation of the current

1.1. Balanced loads

Error limits IEC 62053-21 (± %)	Meter No. 503943	Meter No.503946	Uncertainty measured values (±%)	Power Factor	Value of Rated Current (% In)
Class 1.0	Measurement Errors (± %)				
1.0	0.658	0.658	0.013	1	10
	-0.26	0.078	0.013	1	50
	-0.079	-0.080	0.013	1	60
	-0.078	-0.079	0.013	1	100
	0.140	0.140	0.021	0.5 lag.	
	-0.233	-0.234	-	0.8 lead.	
3.5	0.543	0.489	-	0.25 lag.	
2.5	-0.291	-0.343	0.021	0.5 lead.	120
1.0	-0.185	-0.132	0.013	1	
	-0.183	-0.078	0.021	0.5 lag.	
	-0.079	-0.288	-	0.8 lead.	
-	-0.082	-0.082	-	0.25 lag.	
	-0.179	-0.074	0.021	0.5 lead.	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 3 of 8

1.2. Carrying a single-phase load, but with balanced polyphase voltages applied to voltage circuits

Error limits IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Uncertainty measured values (±%)	Power Factor	Current in Phase	Value of Rated Current (% In)
Class 1.0	Measurement Errors (± %)					
2.0	1.31	1.34	0.013	1	R	5
	1.17	1.37			S	
	1.17	1.18			T	
	-0.093	-0.141	0.013	1	R	100
	-0.188	0.004			S	
	0.002	-0.045			T	
	0.105	0.153	0.021	0.5 lag.	R	
	0.344	0.295			S	
	0.305	0.062			T	
	-0.184	-0.131	0.013	1	R	120
	-0.185	-0.185			S	
	-0.132	-0.184			T	
	-0.189	-0.137	0.021	0.5 lag.	R	
	-0.075	0.029			S	
	0.33	-0.124			T	

2. Error due to ambient temperature variation

Limits mean temperature coefficient IEC 62053-21 (± %/K)	Meter No. 503946				Power Factor	Value of Rated Current (% In)
	Mean temperature coefficient (± %/K)					
	-20°	0°	40°	60°		
Class 1.0						
0.05	0.018	0.007	-0.004	-0.003	1.0	5
0.07	0.039	0.013	0.001	0.007	0.5	10
0.05	0.036	0.013	-0.004	-0.004	1.0	100
0.07	0.015	0.006	-0.009	-0.007	0.5	
0.05	0.031	0.023	-0.004	-0.004	1.0	120
0.07	0.010	0.004	-0.019	-0.012	0.5	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 4 of 8

Limits mean temperature coefficient IEC 62053-21 (± %/K)	Meter No. 503943				Power Factor	Value of Rated Current (% In)
	Mean temperature coefficient (± %/K)					
	-20°	0°	40°	60°		
Class 1.0						
0.05	-0.006	-0.001	0.010	0.008	1.0	5
0.07	0.028	0.006	0.016	0.024	0.5	10
0.05	0.028	0.010	0.012	0.010	1.0	100
0.07	0.003	0.004	0.004	0.001	0.5	
0.05	0.024	0.009	0.003	0.010	1.0	120
0.07	0.005	-0.009	0.018	0.006	0.5	

3. Error due to voltage variation

Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Uncertainty measured values (±%)	Voltages (%Vn)	Power Factor	Value of Rated Current (% In)
	Mean variation					
	Error (± %)					
Class 1.0						
0.7	-0.04	-0.08	0.015	90	1.0	5
	0.17	0.13		110		
1.0	-0.16	-0.09	0.021	90	0.5	10
	0.13	0.13		110		
0.7	0.00	-0.04	0.015	90	1.0	100
	0.02	-0.03		110		
1.0	-0.07	-0.01	0.021	90	0.5	
	-0.06	0.05		110		
0.7	-0.04	0.01	0.015	90	1.0	120
	-0.04	-0.02		110		
1.0	-0.04	0.01	0.021	90	0.5	
	-0.04	0.08		110		

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 5 of 8

4. Error due to frequency variation

Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Uncertainty measured values (±%)	Frequency (Hz)	Power Factor	Value of Rated Current (% In)
	Mean variation Error (± %)					
Class 1.0						
0.5	0.00	0.11	0.015	49	1.0	5
0.7	0.00	0.06		51		
0.5	0.05	0.08	0.021	49	0.5	10
0.7	-0.01	0.01		51		
0.5	0.00	0.05	0.015	49	1.0	100
0.7	-0.05	0.05		51		
0.5	-0.06	0.10	0.021	49	0.5	
0.7	-0.15	-0.05		51		
0.5	0.05	0.05	0.015	49	1.0	120
0.7	-0.05	0.00		51		
0.5	0.10	-0.05	0.021	49	0.5	
0.7	0.06	-0.10		51		

5. Error due to reversed phase sequence

Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Uncertainty measured values (±%)	Value of Rated Current (% In)
Class 1.0	Mean variation Error (± %)			
1.5	0.103	0.001	0.013	10

6. Error due to voltage unbalance

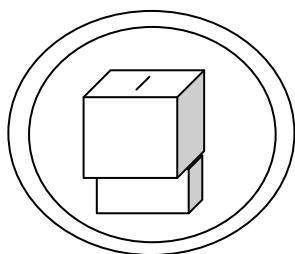
Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Strain in Phase	Value of Rated Current (% In)
Class 1.0	Mean variation Error (± %)			
2.0	-0.11	0.00	AB	100
	-0.11	-0.05	BC	
	0.11	-0.10	AC	
	-0.10	-0.05	A	
	-0.05	0.00	B	
	0.05	0.05	C	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 6 of 8

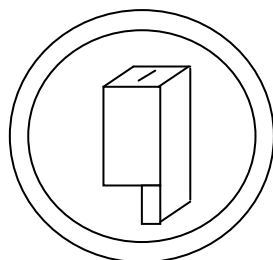
7. Error due to harmonic components in the current and voltage circuit

Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Meter No.503946	Value of Current
	Mean variation Error (± %)		
Class 1.0			
0.8	0.07	0.02	0.5 I _{max}

8. Error due to magnetic indication of external origin 0.5 mT

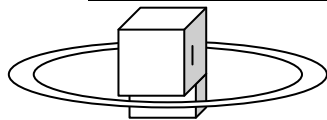


Limits variation error IEC 62053-21 ($\pm$ %)	Meter No. 503943 Mean Error ($\pm$ %)	Uncertainty measured values ($\pm$ %)	Corner of turn of a magnetic field in degree
Class 1.0	-0.05	0.028	Before influence of a magnetic field
	-0.07		0
	-0.11		60
	-0.03		120
	-0.07		180
	-0.07		240
	-0.07		300
	-0.07		360
	-0.05		After influence of a magnetic field
2.0	0.02	Variation Error (+)	
	-0.06	Variation Error (-)	



Limits variation error IEC 62053-21 ($\pm$ %)	Meter No.503943 Mean Error ($\pm$ %)	Uncertainty measured values ($\pm$ %)	Corner of turn of a magnetic field in degree
Class 1.0	-0.05	0.028	Before influence of a magnetic field
	-0.06		0
	-0.05		60
	-0.09		120
	-0.05		180
	-0.05		240
	-0.09		300
	-0.09		360
	-0.05		After influence of a magnetic field
2.0	0.00	Variation Error (+)	
	-0.04	Variation Error (-)	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 7 of 8



Limits variation error IEC 62053-21 (± %)	Meter No.503943 Mean Error (± %)	Uncertainty measured values (±%)	Corner of turn of a magnetic field in degree
Class 1.0	-0.06	0.028	Before influence of a magnetic field
	-0.07		0
	-0.07		60
	-0.08		120
	-0.04		180
	-0.11		240
	-0.12		300
	-0.08		360
	-0.06		After influence of a magnetic field
	-0.06		
2.0	0.02	Variation Error (+)	
	-0.06	Variation Error (-)	

9. Error due to fast transient burst

Limits of variation error IEC 62053-21 (± %)	Meter No.503943	Uncertainty measured values (±%)	Value of Current (A)
Class 1.0	Mean variation Error (± %)		
4.0	0.28	0.013	5

10. Test of initial start-up of the meter

Limit time of initial start-up of IEC 62053-21 (sec)	Meter No.503943	Meter No.503946	
5.0	1.5	1.3	Time of initial start-up (sec)

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/5/06
	No. 181-2006	Number of pages: 8 of 8

11. AC voltage test

Meter No.503943	Meter No.503946
PASS	PASS

Note: This test was done at 2000V AC.

Remark: The stated uncertainties are specified as expanded measurement uncertainty resulting from the standard measurement uncertainties multiplied by the coverage factor $K=2$, which represent a confidence interval of approximately 95% for a normal distribution in accordance to standard IEC/ISO 17025..

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Environmental data:

Temperature: (23 ± 2) °C

Relative humidity (50 ± 15) %

References: International Standards IEC 62052-11 and IEC 62053-22

END OF REPORT

	Name	Signature
Tested by	G. Mitelman	
Checked by	B. Ricanati	
Approved by	A. Stern	