

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 1 of 8

Test report of samples "Powermeters PM172"

List of samples

Manufacturer	Type	Serial number	Reference voltage, V	Rated (maximum) current, A	Reference frequency, Hz
SATEC	PM172E	517581 517583	3 x 120	3 x 5(10)	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 IEC62053-22	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.
8.2.2	-	Error due to sub-harmonics in the a.c. current circuit	8.
8.2.3	-	Error due to magnetic indication of external origin 0.5 mT	9.
8.2	7.5.4	Error due to fast transient bust	10.
8.3.1	-	Test of initial start-up of the meter	11.
8.3.3	-	Test of starting	12.
7.4	7.3.3	AC voltage Insulation test	13.

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 2 of 8

TEST RESULTS

1. Test No.1. Error due to variation of the current

1.1. Balanced loads

Error limits IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Uncertainty measured values (±%)	Power Factor	Value of Rated Current (% In)
Class 0.2S	Measurement Errors (± %)				
0.4	0.069	-0.026	0.016	1	1
	0.089	0.014	0.013	1	2
0.5	0.249	0.122	0.021	0.5 lag.	
	-0.019	-0.122	-	0.8 lead.	5
0.2	0.050	0.004	0.013	1	
0.5	0.188	0.148	0.021	0.5 lag.	100
	-0.029	-0.084	-	0.8 lead.	
0.2	-0.043	-0.039	0.013	1	100
0.3	0.056	0.056	0.021	0.5 lag.	
	-0.061	-0.102	-	0.8 lead.	50
0.5	0.147	0.169	-	0.25 lag.,	
	-0.119	-0.196	0.021	0.5 lead.	60
0.2	-0.085	-0.084	0.013	1	
	-0.079	-0.059	0.013	1	100
0.3	-0.080	-0.100	0.013	1	
	-0.226	-0.184	0.021	0.5 lag.	120
0.5	0.015	-0.044	-	0.8 lead.	
	-0.337	-0.232	-	0.25 lag.	200
	0.104	0.026	0.021	0.5 lead.	
0.2	-0.085	-0.085	0.013	1	120
0.3	-0.257	-0.196	0.021	0.5 lag.	
	-0.007	-0.027	-	0.8 lead.	200
0.5	-0.481	-0.322	-	0.25 lag.	
	0.112	0.032	0.021	0.5 lead.	200
0.2	-0.115	-0.097	0.013	1.0	
0.3	-0.343	-0.283	0.021	0.5 lag.	200
	0.018	-0.001	-	0.8 lead.	
0.5	-0.669	-0.511	-	0.25 lag.	
	0.161	0.119	0.021	0.5 lead.	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	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 62053-22 (± %)	Measurement Errors (± %)	Uncertainty measured values (±%)	Power Factor	Current in Phase	Value of Rated Current (% In)
Class 0.2S	Meter No.517581				
0.3	0.04	0.013	1	R	5
	0.05			S	
	0.02			T	
0.4	0.10	0.021	0.5 lag.	R	10
	0.16			S	
	0.08			T	
0.3	-0.14	0.013	1	R	100
	-0.09			S	
	-0.16			T	
0.4	-0.27	0.021	0.5 lag.	R	100
	-0.18			S	
	-0.33			T	
0.3	-0.12	0.013	1	R	120
	-0.06			S	
	-0.14			T	
0.4	-0.24	0.021	0.5 lag.	R	120
	-0.18			S	
	-0.32			T	
0.3	-0.10	0.013	1	R	200
	-0.06			S	
	-0.16			T	
0.4	-0.27	0.021	0.5 lag.	R	200
	-0.23			S	
	-0.40			T	

2. Error due to ambient temperature variation

Limits mean temperature coefficient IEC 62053-22 (± %/K)	Meter No.517581				Power Factor	Value of Rated Current (% In))
	Mean temperature coefficient (± %/K)					
	-20°	0°	40°	60°		
Class 0.2S						
0.01	0.005	0.006	-0.005	-0.007	1.0	5
0.02	0.001	0.004	-0.004	-0.004	0.5	10
0.01	0.000	0.005	-0.004	-0.004	1.0	100
0.02	0.007	0.005	-0.005	-0.008	0.5	
0.01	0.001	0.003	-0.004	-0.003	1.0	120
0.02	0.009	0.005	-0.008	-0.008	0.5	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 4 of 8

Limits mean temperature coefficient IEC 62053-22 (± %/K)	Meter No.517583				Power Factor	Value of Rated Current (% In)
	Mean temperature coefficient (± %/K)					
	-20°	0°	40°	60°		
Class 0.2S						
0.01	0.006	0.005	-0.001	-0.007	1.0	5
0.02	-0.001	0.003	-0.003	-0.005	0.5	10
0.01	-0.003	0.004	-0.002	-0.004	1.0	100
0.02	0.004	0.004	-0.001	-0.006	0.5	
0.01	-0.003	0.002	-0.001	-0.005	1.0	120
0.02	0.004	0.005	-0.001	-0.006	0.5	

3. Error due to voltage variation

Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Uncertainty measured values (±%)	Voltages (%Vn)	Power Factor	Value of Rated Current (% In)
	Mean variation Error (± %)					
Class 0.2S						
0.1	-0.01	0.01	0.015	90	1.0	5
	0.00	0.00		110		
0.2	0.00	0.01	0.021	90	0.5	10
	0.01	0.00		110		
0.1	0.02	-0.02	0.015	90	1.0	100
	0.02	0.04		110		
0.2	-0.01	-0.01	0.021	90	0.5	
	0.01	0.01		110		
0.1	0.02	0.00	0.015	90	1.0	120
	0.03	-0.01		110		
0.2	-0.03	-0.01	0.021	90	0.5	
	-0.01	0.00		110		
0.1	-0.02	0.03	0.015	90	1.0	200
	-0.02	0.01		110		
0.2	-0.01	0.00	0.021	90	0.5	
	-0.01	0.00		110		

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 5 of 8

4. Error due to frequency variation

Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Uncertainty measured values (±%)	Frequency (Hz)	Power Factor	Value of Rated Current (% In)
	Mean variation Error (± %)					
Class 0.2S						
0.1	-0.01	0.03	0.015	49	1.0	5
	0.01	0.00		51		
	0.00	-0.03	0.021	49	0.5	10
	0.00	0.01		51		
	0.00	-0.02	0.015	49	1.0	100
	-0.01	0.02		51		
	0.01	-0.01	0.021	49	0.5	
	0.00	0.02		51		
	0.02	-0.02	0.015	49	1.0	120
	0.00	0.04		51		
	-0.01	-0.05	0.021	49	0.5	
	0.02	0.01		51		
	0.02	-0.02	0.015	49	1.0	200
	0.00	0.02		51		
	-0.01	-0.04	0.021	49	0.5	
	0.03	0.02		51		

5. Error due to reversed phase sequence

Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Uncertainty measured values (±%)	Value of Rated Current (% In)
	Mean variation Error (± %)			
Class 0.2S				
0.05	0.000	0.042	0.013	10

6. Error due to voltage unbalance

Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Strain in Phase	Value of Rated Current (% In)
Class 0.2S				
0.5	0.03	0.04	AB	100
	0.03	0.06	BC	
	0.02	0.01	AC	
	0.11	0.09	A	
	0.07	0.03	B	
	0.05	0.09	C	

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 6 of 8

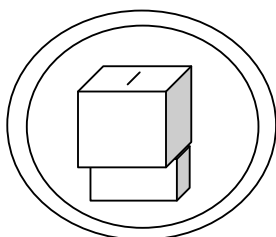
7. Error due to harmonic components in the current and voltage circuit

Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Value of Current
	Mean variation Error (± %)		
Class 0.2S			
0.4	0.00	0.00	0.5 I _{max}

8. Error due to sub-harmonics in the a.c. current circuit

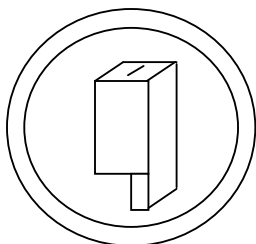
Limits variation error IEC 62053-22 (± %)	Meter No.517581	Meter No.517583	Value of Current
	Mean variation Error (± %)		
Class 0.2S			
0.6	0.02	-0.02	0.5 In

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

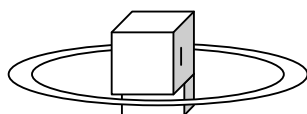


Limits variation error IEC 62053-22 ($\pm$ %)	Meter No.517581	Corner of turn of a magnetic field in degree
	Mean Error ($\pm$ %)	
Class 0.2S	-0.08	Before influence of a magnetic field
	-0.11	0
	-0.09	60
	-0.09	120
	-0.13	180
	-0.09	240
	-0.09	300
	-0.13	360
	-0.08	After influence of a magnetic field
0.5	0.00	Variation Error (+)
	-0.05	Variation Error (-)

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 7 of 8



Limits variation error IEC 62053-22 ($\pm$ %)	Meter No.517581	Corner of turn of a magnetic field in degree
	Mean Error ($\pm$ %)	
Class 0.2S	-0.05	Before influence of a magnetic field
	-0.05	0
	-0.09	60
	-0.09	120
	-0.05	180
	-0.05	240
	-0.05	300
	-0.09	360
	-0.05	After influence of a magnetic field
0.5	0.00	Variation Error (+)
	-0.04	Variation Error (-)



Limits variation error IEC 62053-22 ($\pm$ %)	Meter No.517581	Corner of turn of a magnetic field in degree
	Mean Error ($\pm$ %)	
Class 0.2S	-0.05	Before influence of a magnetic field
	-0.09	0
	-0.09	60
	-0.09	120
	-0.09	180
	-0.09	240
	-0.13	300
	-0.09	360
	-0.05	After influence of a magnetic field
0.5	0.00	Variation Error (+)
	-0.08	Variation Error (-)

10. Error due to fast transient bust

Limits variation error IEC 62053-22 ($\pm$ %)	Meter No.517583	Uncertainty measured values ($\pm$ %)	Value of Current (A)
	Mean variation Error ($\pm$ %)		
Class 0.2S			
1.0	-0.02	0.013	5

11. Test of initial start-up of the meter

Limit time of initial start-up IEC 62053-22 (sec)	Meter No.517581	Meter No.517583	
5.0	3.5	3.5	Time of initial start-up (sec)

ISRAEL ELECTRIC CORP. METERING STATION DEPT. STANDARD LAB.	Test Report	DATE: 17/05/06
	No.178-2006	Number of pages: 8 of 8

12. Test of starting

Current maximum of the meter shall start IEC 62053-22 (A)	Meter No.517581
0.005	PASS

13. AC voltage Insulation test

Meter No.517581	Meter No.517583
PASS	PASS

Note: This test it 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..

This test report may not be reproduced other than in full, except with the permission of the laboratory and according to ISRAC/ILAC regulations.

Tests reports without laboratory authorized stamp and signatures are not valid.

Environmental data:

Temperature: $(23 \pm 2) ^\circ\text{C}$

Relative humidity $(50 \pm 15) \%$

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	