

# Moving Test – MT680s

Single-phase Test System with  
Integrated Current Source



Accuracy Class 0.1

### General

The state of the art test system MT680s consists of a class 0.1 reference meter with built-in current source (up to 120 A). The system is particularly designed for analysis of complete metering installations and local mains conditions.

The equipment offers high functionality combined with an excellent menu guided operation via colored 6.5" touch screen or externally via interface.



Alphanumeric keypad

### Features

- Accuracy class 0.1
- Direct measurement up to 120 A and 500 V
- Calibration under real load conditions
- Verification of the energy registration
- 4 quadrant measurement
- Harmonic spectrum analysis
- Wave form analysis



6.5" Touch screen

### Functions

- Testing meter installations in two-wire systems
- Power and energy measurements for active, reactive and apparent power
- Measuring frequency, phase shift and power factor
- Harmonic spectrum analysis for voltage and current up to the 40th order
- Measuring the distortion factor
- Vector representation of the measuring values
- Oscilloscope function for curve scanning
- Energy dosing with built-in current source



MT680s suitcase

Single-phase meter

### Data Management

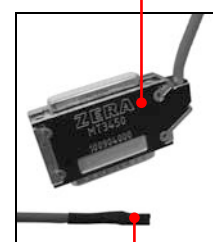
For later download on a PC, the operator can store all test results and measuring values on a Compact-Flash-Memory-Card. The data management software MTVis provides the ability to transfer the data between MT680s and an external PC.

All test results can be summarized and printed in a test report by putting the compact-flash-memory card into an external PC.

### Temperature Sensor MT3450 (optional)

The temperature sensor MT3450 can be used with the devices of the MT-series. It serves for temperature registration on-site. The temperature will be indicated on the MT-display and will be recorded every time data are stored.

Stackable Sub-D plug



Temperature sensor

### Actual Values Measurement

All instantaneous values are displayed simultaneously in a summary:

- RMS values of voltage and current
- Phase angle between voltage and current
- Active, reactive and apparent power
- Test frequency
- Power factor ( $\cos \varphi$ )



### Vector Display

The colored vector diagram display for voltage and current makes it very easy to detect wiring faults in voltage and current circuits.

All measured values can be stored on the Compact-Flash-Memory according to the customer information data.



### Error Measurement

By entering all relevant test parameters, like meter constant and the number of pulses, the system can perform the error measurement on electricity meters. The percentage error including all statistical values can be stored according to the customer information data. In order to inform the operator about the status of the measurement a bar graph indicates continuously the measured energy as well as the detected metrology pulses from the unit under test.



### Automatic Operation

By using predefined test routines the MT680s system can operate automatically without need of an external PC.



### Harmonic Measurement

Due to the high sampling rate of the working standard the MT680s is able to measure harmonics in voltage and current up to the 40<sup>th</sup> THD (conform to the voltage quality norm DIN EN 50160). The measured harmonic spectrum can be displayed in a chart or in a logarithmic diagram.



## MT680s Single-phase Test System

### General

Power supply	85 ... 265 V, 47 ... 63 Hz
Power consumption	max. 135 VA
Temperature range, operation	-10° ... + 50° C
Temperature range, storage	-15° ... + 65° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	248 x 300 x 196,2 mm
Weight	~ 8.4 kg

### Safety

IP class according to DIN EN 60529	IP30
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	I
Overvoltage category voltage measurement	CAT III 300 V / CAT II 600 V
Overvoltage category current measurement	CAT III 300 V / CAT II 600 V

### Reference meter

Measuring modes	2WA / 2WR / 2WAP
Fundamental frequency	45 ... 65 Hz
Bandwidth	3000 Hz
Sampling	16 bit 504 samples/period
Accuracy class for measuring of power / energy	0.1
Angle measurement accuracy 3) 4)	< 0.015°
Frequency measurement deviation	± 0.01 Hz

### Voltage Measurement

Voltage measurement	5 mV ... 500 V
Voltage range(s)	250 mV, 5 V, 60 V, 125 V, 250 V, 420 V
Voltage measurement accuracy 5)	< 0.05 % @ 30 V ... 500 V < 1 % @ 50 mV ... < 30 V < 3 % @ 5 mV ... < 50 mV
Voltage measurement temperature drift 3)	< 15 x 10 E-6 / K
Voltage measurement stability 1) 3)	< 60 x 10 E-6
Voltage measurement long term stability 2) 3)	< 100 x 10 E-6 / Year

### Current measurement

Current measurement	1 mA ... 120 A
Current range(s)	100 A, 50 A, 20 A, 10 A, 5 A, 2 A, 1 A, 0.5 A, 0.2 A, 0.1 A, 0.05 A, 0.02 A
Current measurement accuracy 5)	< 0.05 % @ 10 mA ... 120 A < 0.2 % @ 5 mA ... < 10 mA
Current measurement temperature drift 4)	< 20 x 10 E-6 / K
Current measurement stability 1) 4)	< 70 x 10 E-6
Current measurement long term stability 2) 4)	< 100 x 10 E-6 / Year

### Power Measurement

Power/energy measurement accuracy 3) 6)	< 0.1 % @ 10 mA ... 120 A < 0.25 % @ 5 mA ... < 10 mA
Power/energy measurement temperature drift 3) 4)	< 35 x 10 E-6 / K
Power/energy measurement stability 1) 3) 4)	< 100 x 10 E-6
Power/energy measurement long term stability 2) 3) 4)	< 200 x 10 E-6 / Year

### Source

Current min. max.	1 mA ... 120 A
Current range(s)	100 A, 50 A, 20 A, 10 A, 5 A, 2 A, 1 A, 0.5 A, 0.2 A, 0.1 A, 0.05 A, 0.02 A
Current max. voltage per range	0.6 V (100 A .. 10 A), 2.7V (5 A), 8V (2 A .. 0.02 A)
Current max. output power 8)	60 VA
Current accuracy 4)	< 0.1 %
Current distortion 4)	< 0.5 %
Frequency range	45 ... 65 Hz
Phase angle setting range	0.00 ... 359.99°
Phase angle stability 4) 9)	< 0.15 °

- 1: Stability over 1 hour (every minute one measurement with  $t_i = 60$  s)  
 2: Stability over 1 year (every month one measurement with  $t_i = 60$  s)  
 3: From 30 V ... 500 V  
 4: From 10 mA ... 120 A  
 5: Related to the read value at optimum range selection  
 6: Related of apparent power  
 7: of range 30 % ... 120 %  
 8: Related of end of maximum range and end of range and ohmic load  
 9: Stability over 1 hour (measurement with  $t_i = 10$  s)

11.01.2013

Subjects to alteration.