

Moving Test – MT681

Accuracy Class 0.1



MT681 – Three-phase Fully Automatic Test System with Integrated Current Source

General

The state of the art test system MT681 consist of a class 0.1 reference meter with built-in current source up to 100 A. It 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 built-in soft-keys and coloured 6.4" LCD-display or optionally via corresponding software and PC.



Field of Application

- Verification of the load conditions on metering installations
- Verification of the energy registration
- Testing of meters with accuracy classes 1 and 2
- 4 Quadrant measurement
- Frequency-, phase angle and power measurement
- Independent generation of load conditions by using incoming voltage from the grid
- Testing of 3 or 4 wire systems with pulse output
- Harmonic spectrum analysis
- Wave form analysis
- Accuracy class 0.1



Also available with trolley (optional)

Functions

- User friendly menu guided operation
- Vector diagram display and phase sequence indication on integrated colour-screen
- Extendable compact flash memory for storage of customer data and measurement results
- Easy verification and analysis of meter installations
- **No** additional error for reactive measurements
- Automatic operation without need of an external PC

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 MT681 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.

External Control via SSM3000

For external control of portable devices via PC, SSM3000 software is optionally available. The control software is a windows application and offers a comfortable user interface on PC. SSM3000 can be used for controlling, storing of test results and for administration of the type-referring data of the devices to be tested.

Actual Value Measurement

All instantaneous values are simultaneously displayed.

- RMS values of voltage and current
- Phase angle between voltage and current
- Active, reactive and apparent power
- Test frequency
- Power factor



Vectorial Display

The coloured 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.



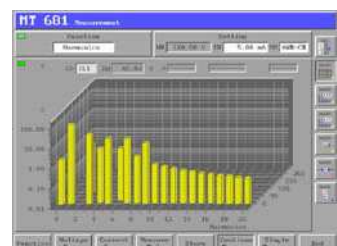
Automatic Operation

By using predefined test routines the MT681 system can operate automatically without need of an external PC.



Harmonic Measurement

Due to the high sampling rate of the working standard the MT681 is able to measure harmonics in voltage and current up to the 40th 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.



Portable Test System with integrated Current Source

MT681

General

Power supply	85 ... 265 V, 47 ... 63 Hz
Power consumption	max. 350 VA
Temperature range, operation	-10° ... + 45° C
Temperature range, storage	-15° ... + 65° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	192 x 485 x 392 mm
Weight	~ 16.5 kg

Safety

IP class according to DIN EN 60529	IP40
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 3WA / 3WR / 3WAP / 3WRCA / 3WRCA 4WA / 4WAb / 4WR / 4WRb / 4WAP / 4WAPb / 4WRC
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	100 mV ... 300 V
Voltage range(s)	5 V, 250 V
Voltage measurement accuracy 5)	< 0.05 % @ 30 ... 300 V < 1 % @ 1 V ... < 30 V < 3 % @ 100 mV ... < 1 V
Voltage measurement temperature drift 3)	< 15 x 10 ⁻⁶ / K
Voltage measurement stability 1) 3)	< 50 x 10 ⁻⁶
Voltage measurement long term stability 2) 3)	< 100 x 10 ⁻⁶ / Year

Current measurement

Current measurement	1 mA ... 100 A
Current range(s)	100 A, 50 A, 25 A, 12 A, 6 A, 3 A, 1.2 A, 0.6 A, 0.3 A, 0.12 A, 0.06 A [100 A, 50 A, 10 A, 5 A, 1 A, 0.5 A, 0.1 A, 0.05 A]
Current measurement accuracy 5)	< 0.05 % @ 10 mA ... 100 A < 0.2 % @ 5 mA ... < 10 mA < 1 % @ 1 mA ... < 5 mA [< 0.15 % @ 500 mA ... 120 A] [< 0.3 % @ 100 mA ... < 500 mA]
Current measurement temperature drift 4)	< 15 x 10 ⁻⁶ E-6 / K [< 50 x 10 ⁻⁶ E-6 / K]
Current measurement stability 1) 4)	< 70 x 10 ⁻⁶ [< 150 x 10 ⁻⁶ E-6]
Current measurement long term stability 2) 4)	< 100 x 10 ⁻⁶ / Year [< 600 x 10 ⁻⁶ E-6] / Year

Power Measurement

Power/energy measurement accuracy 3) 6)	< 0.1 % @ 10 mA ... 100 A < 0.25 % @ 5 mA ... < 10 mA < 1 % @ 1 mA ... < 5 mA [< 0.2 % @ 500 mA ... 120 A] [< 0.35 % @ 100 mA ... < 500 mA]
Power/energy measurement temperature drift 3) 4)	< 30 x 10 ⁻⁶ E-6 / K [< 65 x 10 ⁻⁶ E-6]
Power/energy measurement stability 1) 3) 4)	< 100 x 10 ⁻⁶ [< 200 x 10 ⁻⁶ E-6]
Power/energy measurement long term stability 2) 3) 4)	< 100 x 10 ⁻⁶ / Year [< 700 x 10 ⁻⁶ E-6] / Year

Source

Current min. max.	1 mA ... 100 A
Current range(s)	100 A, 50 A, 25 A, 12 A, 6 A, 3 A, 1.2 A, 0.6 A, 0.3 A, 0.12 A, 0.06 A
Current max. voltage per range	0.5 V (100 A ... 12 A), 0.8 V (< 12 ... 6 A), 1.2 V (< 6 ... 3 A), 2.3 V (< 3 A)
Current max. output power 8)	50 VA
Current accuracy 4)	< 0.1 %
Current distortion	< 0.5 % @ 50 mA ... 120 A
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 ... 300 V
4: From 10 mA ... 100 A [500 mA ... 120 A]
5: Related to the read value at optimum range selection
6: Related of apparent power
7: of range
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)
[] ± with AC current clamps MT3430

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