

Moving Test – MT781/MT786

Three-phase Fully Automatic Test System with
Integrated Current and Voltage Source



MT781 – Accuracy Class 0.1

MT786 – Accuracy Class 0.05

General

The state of the art test system MT781 consist of a class 0.1 reference meter (MT786 class 0.05) with built-in voltage/current source (up to 500 V/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 built-in soft-keys and colored 10.4" LCD-display.



Features

- Verification of the load conditions on metering installation
- Verification of the energy registration
- 4 quadrant measurement
- Frequency-, phase angle- and power factor measurement
- Testing of 3 or 4 wire systems with pulse output
- Harmonic spectrum analysis
- Wave form analysis
- Available with:
 - Accuracy class 0.1 (MT781)
 - Accuracy class 0.05 (MT786)



Functions

- User friendly menu guided operation
- Vector diagram display and phase sequence indication on integrated colored 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



Available with trolley (option)

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 MT78x 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.

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 MT78x system can operate automatically without need of an external PC.



Harmonic Measurement

Due to the high sampling rate of the working standard the MT78x 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 Source

MT781

MT786

General

Power supply	85 ... 265 V, 47 ... 63 Hz
Power consumption	max. 500 VA
Temperature range, operation	-10° ... + 50° C
Temperature range, storage	-15° ... + 65° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	206 x 524 x 428 mm
Weight	~ 20 kg

Safety

IP class according to DIN EN 60529	IP30
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	I

Reference meter

Measuring modes	2WA / 2WR / 2WAP 3WA / 3WR / 3WRCA / 3WRCB / 3WAP 4WA / 4WR / 4WRC / 4WAP
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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

Power Measurement

Power/energy measurement accuracy 3) 4) 6)	< 0.1 %
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

Voltage min. max.	20 V ... 500 V
Voltage range(s)	60 V, 125 V, 250 V, 420 V
Voltage max. output power 8)	30 VA
Voltage distortion 3)	< 0.5 %
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 distortion 4)	< 0.5 %
Frequency range	45 ... 65 Hz
Frequency accuracy	0.01 Hz
Phase angle setting range	0.00 ... 359.99°
Phase angle accuracy	< 0.015°
Phase angle stability 9)	< 0.01 °

- 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 imhic load
- 9: Stability over 1 hour (measurement with $t_i = 10$ s)

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Subject to alteration.