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)

Available with trolley (option)

Functions

- User friendly menu guided operation
- Vector diagram display and phase sequence indication on integrated colored screen
- Especially configured USB stick 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
- Generation of harmonics in current and voltage up to the 40th (option)

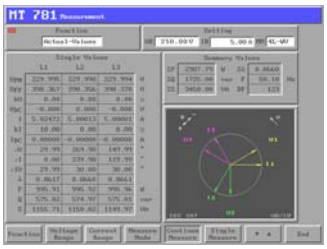
Data Management

For later download on a PC, the operator can store all test results and measuring values on especially configured USB stick. 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.

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 φ)



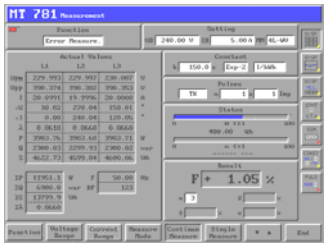
Vector Display

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 USB stick according to the customer information data.

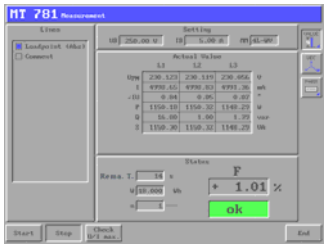
Error Measurement

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.



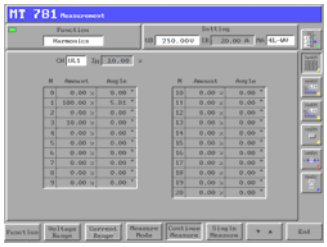
Automatic Operation

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.



Technical Data

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 / 4WAb / 4WR / 4WRb/ 4WRC / 4WAP / 4WAPb	
Fundamental frequency	45 ... 65 Hz	
Bandwidth	3000 Hz	
Sampling	16 bit 504 samples/period	
Accuracy class for measuring of power / energy	0.1	0.05
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	< 0.03 % @ 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	< 10 x 10 E-6 / K
Voltage measurement stability 1) 3)	< 60 x 10 E-6	< 60 x 10 E-6
Voltage measurement long term stability 2) 3)	< 100 x 10 E-6 / Year	< 50 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, 500 mA, 200 mA, 100 mA, 50 mA, 20 mA	
Current measurement accuracy 5)	< 0.05 % @ 10 mA ... 120 A < 0.2 % @ 5 mA ... < 10 mA	< 0.025 % @ 10 mA ... 120 A < 0.2 % @ 5 mA ... < 10 mA
Current measurement temperature drift 4)	< 20 x 10 E-6 / K	< 15 x 10 E-6 / K
Current measurement stability 1) 4)	< 70 x 10 E-6	< 70 x 10 E-6
Current measurement long term stability 2) 4)	< 100 x 10 E-6 / Year	< 80 x 10 E-6 / Year
Power Measurement		
Power/energy measurement accuracy 3) 4) 6)	< 0.1 %	< 0.05 %
Power/energy measurement temperature drift 3) 4)	< 35 x 10 E-6 / K	< 25 x 10 E-6 / K
Power/energy measurement stability 1) 3) 4)	< 100 x 10 E-6	< 100 x 10 E-6
Power/energy measurement long term stability 2) 3) 4)	< 200 x 10 E-6 / Year	< 100 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 %	
Voltage accuracy 3)	< 0.2 %	
Voltage harmonic setting range 10) 14) 15)	2. ... 40.	
Voltage bandwidth 10) 18)	-3 dB @ ~ 3 kHz	
Current min. max.	1 mA … 120 A	
Current range(s)	100 A, 50 A, 20 A, 10 A, 5 A, 2 A, 1 A, 500 mA, 200 mA, 100 mA, 50 mA, 20 mA	
Current max. voltage per range	600 mV (100 A .. 20 A), 2.0 V (10 A), 4.0 V (5 A) 8.0 V (2 A .. 20 mA)	
Current max. output power 8)	60 VA	
Current distortion	< 0.5 % @ 50 mA … 120 A	
Current accuracy 4)	< 0.2 %	
Current harmonic setting range 10) 14) 15)	2. .. . 40.	
Current bandwidth 10) 18)	-3 dB @ ~1.5 kHz	
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 ti = 60 s)
2: Stability over 1 year (every month one measurement over one hour)
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 ti = 10 s)
10: Depending on the selected option
14: Every harmonic (related to fundamental) max. 40 %
15: Total of harmonics max.40 %
18: Depending on the connected load

13.01.2016

Subjects to alteration.

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