

TD3760 Complex Waveform Testing Device



1. Summary

TD3760 is an AC power device specially designed for complex waveform current influence test of new AC energy meters. It meets the test requirements of relevant current influence in OIML R46. The device directly outputs complex current waveforms with high stability and accuracy through the three phase precision standard power source, which can complete the following test items.

(1) **Impact Test of DC and Even Harmonics (The device can directly output half-wave current, no longer use the traditional scheme (rectifier diode))**

(2) **Impact Test of Harmonic in Voltage-current Circuits,**

(3) **Impact Test of Inter-harmonic in the Current Circuits**

(4) **Impact Test of Odd Harmonic in Current Circuits**

(5) **High-order harmonic test**

(6) **Burden current fast change test**

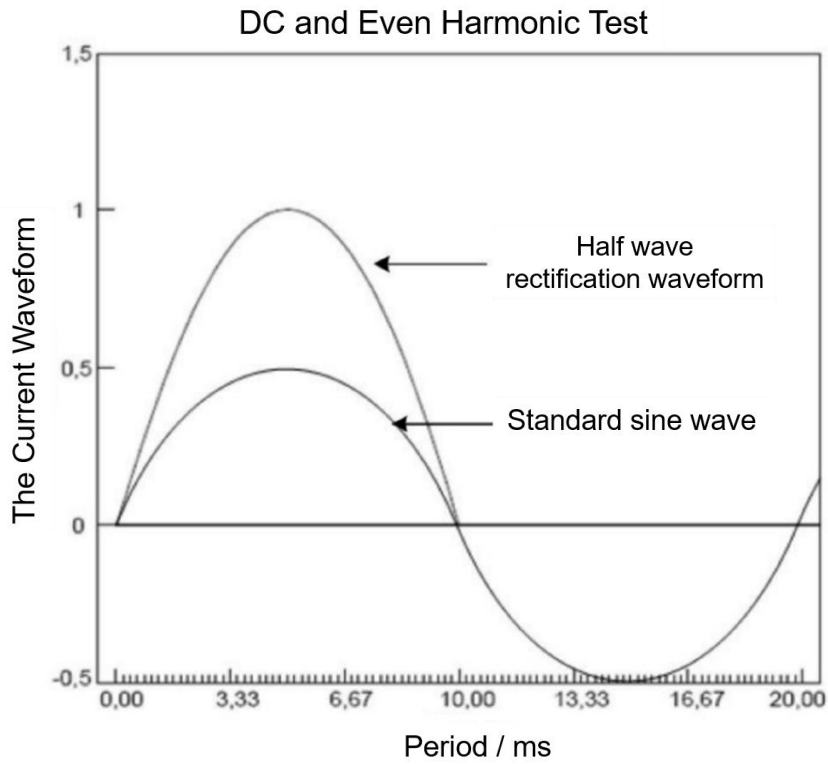
Up to 12 test positions. Accuracy Class **0.05**.

2. Features

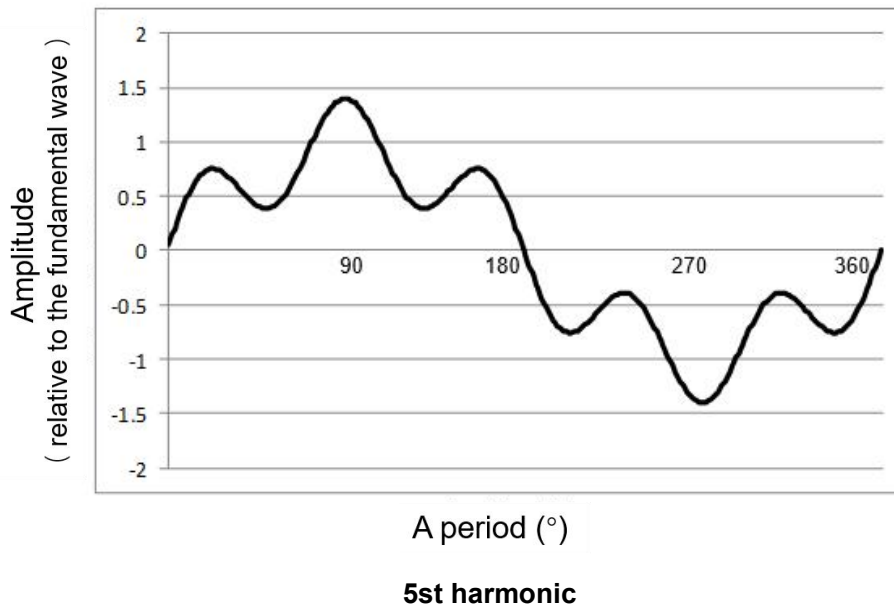
- **Impact Test of Harmonic in Voltage-current Circuits:** Built in square-wave, peaked wave, inter-harmonic and other schemes.
- **Impact Test of Inter-harmonic in the Current Circuits:** The device can directly output the inter-harmonic.
- **Impact Test of Odd Harmonic in Current Circuits:** The device can directly output the odd harmonic.
- **High-order harmonic test:** Built in high-order harmonic test schemes. So it automatically superposes the 15fnom to 40fnom sweep signals to the voltage and current loops and reads the data of each harmonic to measure the error offset caused by the high-order harmonic.
- **Burden current fast change test:** The user can set the duration of ton and toff, as well as the total time for a single test. The current switches at zero crossing and switches off and on within one nominal frequency period. The repetition time of single test was more than 4 hours.
- **Communication:** Communicate with DUT through RS-485 communication port.
- **Multi-position verification platform:** Optional 3,6,12,16 positions.

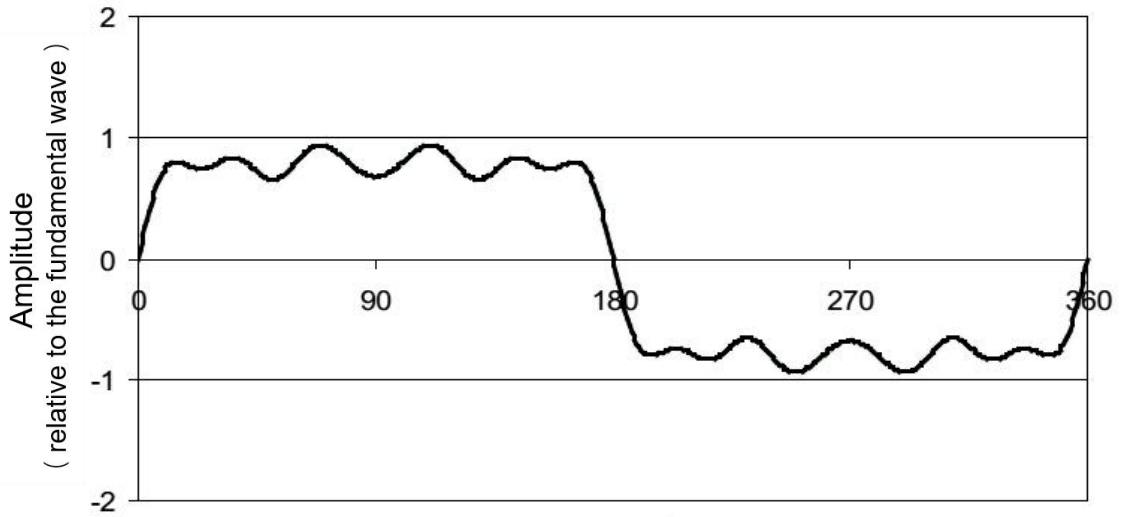
3. Typical Output Waveform

3.1 Half-wave rectification waveform (DC and Even Harmonics)

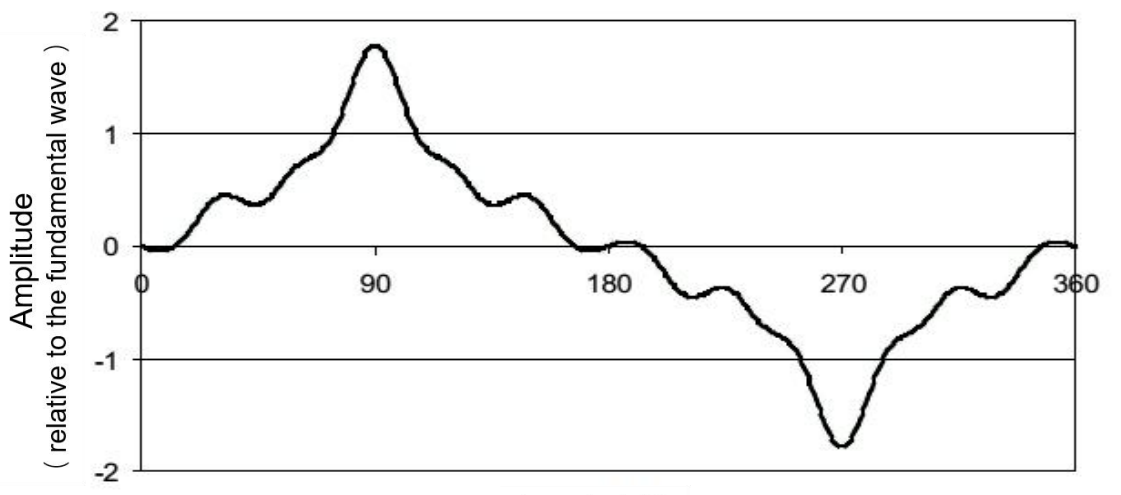


3.2 Waveform of the Impact Test of Harmonic



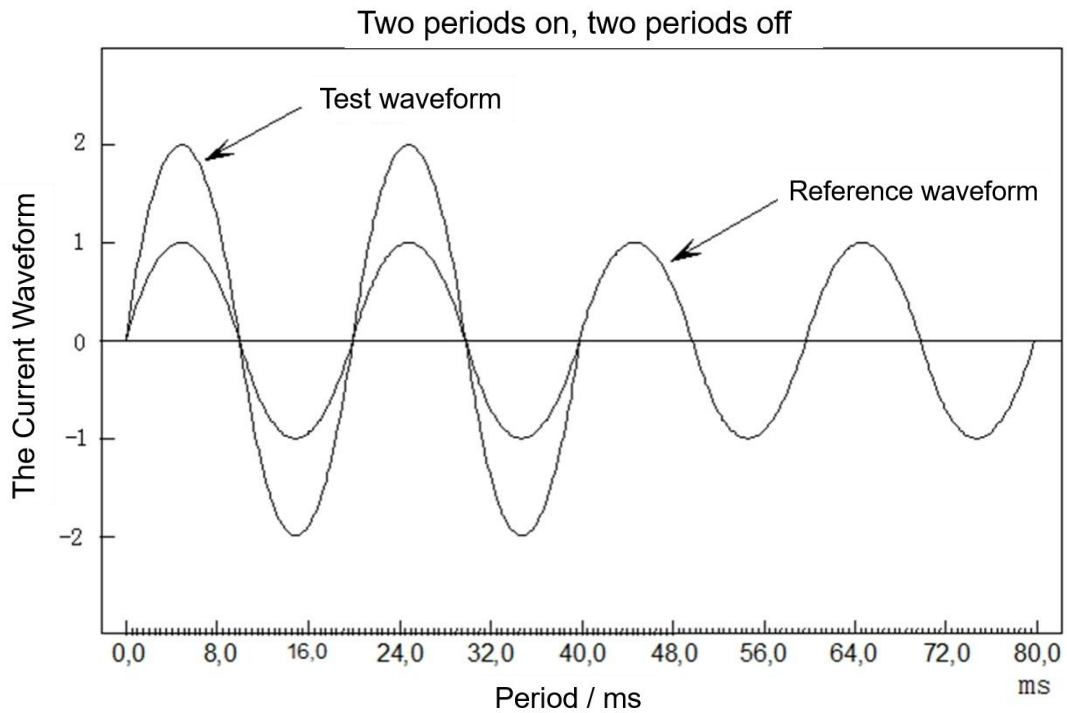


A period (°)
square-wave

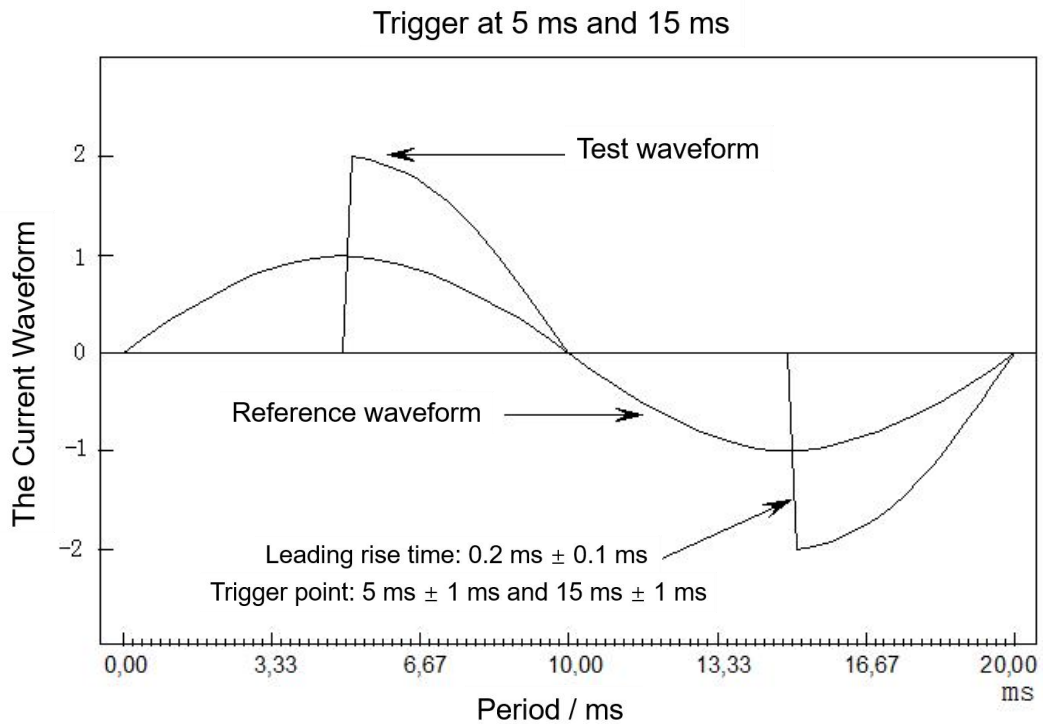


A period (°)
peaked wave

3.3 Inter-harmonic



3.4 Odd Harmonic



4. Specifications

4.1 AC Voltage Output

Range	Resolution	Short-term Stability (% / min)	Accuracy \pm (ppm of reading + ppm of range) ^[1]	Distortion Factor (%)
60 V	0.1 mV	0.01	120 + 80	< 0.3
120 V	1 mV	0.01	120 + 80	< 0.3
240 V	1 mV	0.01	120 + 80	< 0.3
480 V	1 mV	0.01	120 + 80	< 0.3

Note [1] : (ppm = parts per million) (e.g., 10ppm = 0.001%).

- Output range: 0 V ~ 264 V, 6-digits display, load capacity: 15VA/ (phase · position)
- Symmetry: Voltage \leq 0.2%, Phase \leq 0.5°
- Protective function: Short-circuit protection, Overload protection

4.2 AC Current Output

Range	Resolution	Short-term Stability (% / min)	Accuracy \pm (ppm of reading + ppm of range)	Distortion Factor (%)
100 mA	1 μ A	0.01	200 + 100	< 0.2
200 mA	1 μ A	0.01	200 + 100	< 0.2
500 mA	1 μ A	0.01	200 + 100	< 0.2
1 A	10 μ A	0.01	200 + 100	< 0.2
2 A	10 μ A	0.01	200 + 100	< 0.2
5 A	10 μ A	0.01	200 + 100	< 0.2
10 A	100 μ A	0.01	200 + 100	< 0.2
20 A	100 μ A	0.01	200 + 100	< 0.2
50 A	100 μ A	0.01	200 + 100	< 0.2
100 A	1 mA	0.01	200 + 100	< 0.2

- Output range: 20mA ~ 120 A@ full wave, 6-digits display

- Symmetry: Current $\leq 0.5\%$, Phase $\leq 0.5^\circ$
- Protective function: Open-circuit protection, Overload protection, Overheating protection

4.3 Frequency / Phase / Harmonic

Type	Range of Regulation	Accuracy
Frequency	45.000 0Hz~100.000 Hz	50 ppm*RD
Phase	0.000°~359.999°	0.012°
Harmonic Output	the 2nd ~ 63st @ 50 Hz / 60 Hz (support single or multiple simultaneous stacking), harmonic content and phase are programmable (Amplitude: 0~40% , Phase: 0.0°~359.9°).	


4.4 Power / Electrical Energy

- Uncertainty of measurement (k=2): 0.05%*RD
- Output power stability: 0.02% / 2min
- Power/electric energy measuring range: The combination of AC voltage and current range
- Power factor measuring range: -1.000 00...0.000 00...1.000 00
- Standard electric energy pulse output: High frequency pulse output port outputs 60KHz at full range, low frequency pulse output port outputs 6Hz at full range;
- Standard energy pulse input: Frequency ≤ 200 kHz, Voltage: 0...3.3 V...24 V
- Electric energy error display: Auto, resolution is 0.0001%.

5. General Specifications

Power Supply	AC (220 \pm 22) V, (50 \pm 2) Hz
Warm-up Time	30 min
Temperature	Operating temperature: 18°C~28°C; Storage temperature: -10°C~55°C
Humidity	Operating humidity: < 80% @ 30°C, < 70% @ 40°C, < 40% @ 50°C
Performance	Storage humidity: (20%~80%) R·H, non-condensing
Communication Interface	RS232, RS485, LAN

6. Ordering Information

TD3760 - 

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Position Number	
Code	Note
3	3 Positions
6	6 Positions
12	12 Positions

e.g.: *TD3760-12* represents 12 positions.