



CX-2675Y

Medical Leakage Current Tester

Manuals

[HTTP://WWW.CHINA-ITCN.COM](http://www.china-itcn.com)

1.Introduction

Medical leakage current tester is used to measure medical electrical equipment of continuous leakage current and patient auxiliary current test equipment. CX2675Y series medical leakage current tester is according to GB9706.1 _2007 (IEC60601-1: 1988) took the 'medical electrical equipment part 1: general requirements for safety ', design and production. And test circuit (MD) simulation human body impedance input impedance, accord with GB9706.1-2007 (IEC60601 -1 : 1988) requirement, test current up to 5 μ A, and to provide users with A continuous adjustable output voltage of 0 ~ 250 v, output of the basic capacity is configured to 500 va isolation and the other to provide the highest rated voltage of 110% of the voltage source, can satisfy I , II various equipment under normal and single fault in patients with floor drain current, shell leakage current, leakage current, patients with auxiliary leakage current test.

CX2675Y medical leakage current tester series is a full digital display advanced new products, can also display voltage, leakage current and testing time (both for digital display), according to the different needs of users for any leakage current alarm values; Adopting the countdown timer digital display, the accuracy test time is increased to \pm 1%, And test range increased to 99 seconds, function more rich and practical. Medical leakage current tester adopts linear rectifier on the voltage sampling circuit, a change in the past always use the method of bridge rectifier to make test voltage indicated value more exactly reflect the actual test on the load voltage being measured, the error is smaller, the better linear, precision is higher. Instrument in the leakage current test, alternating current detection circuit USES the true effective detection circuit and dc current dc filter circuit, can measure dc, ac, sine wave and complex waveform frequency response can be up to 1 MHZ. CX-2675Y series isolation power supply capacity of leakage current tester if not a suffix to 500 va, if add "1" (such as CX-2675Y- 1) for 1 kva, greater isolation power supply capacity can be made special.

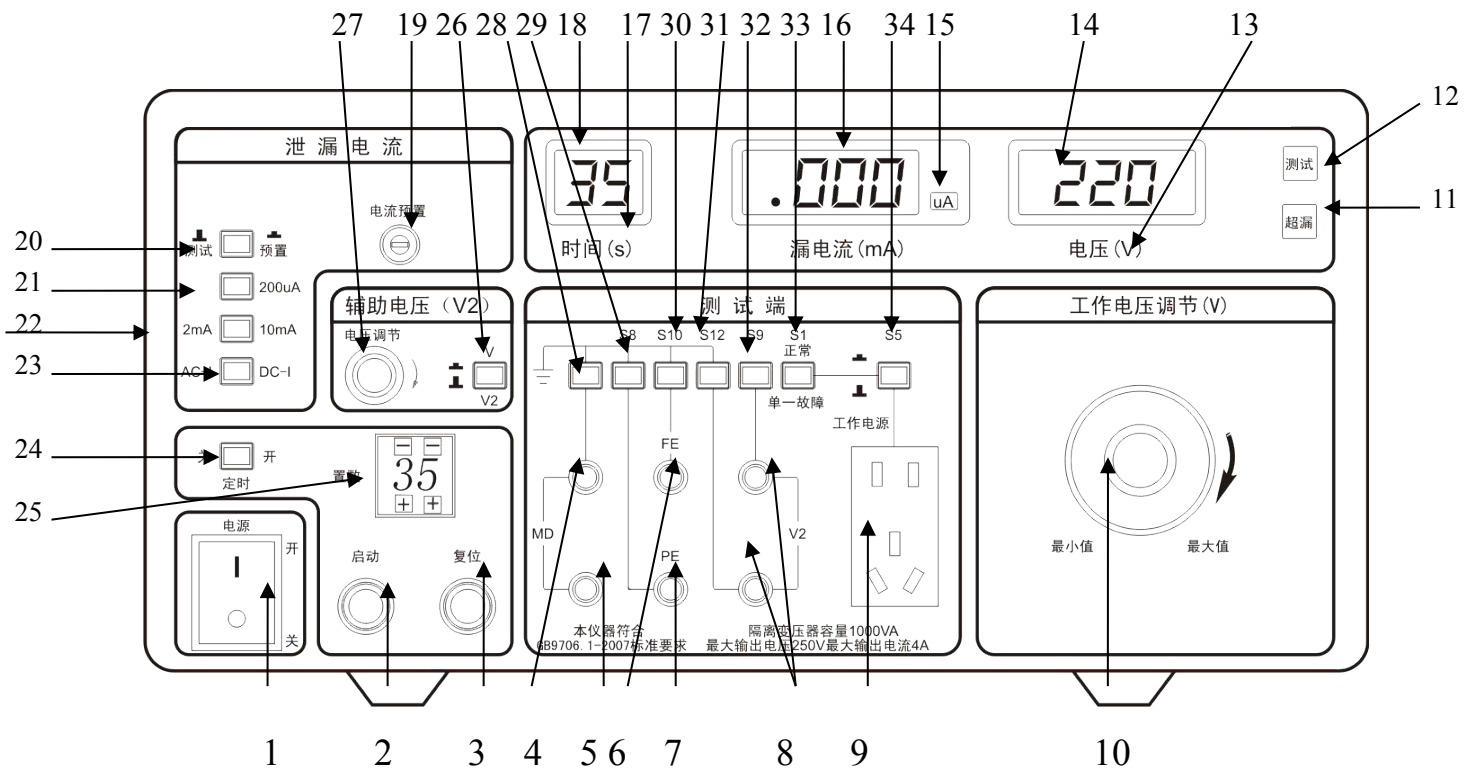
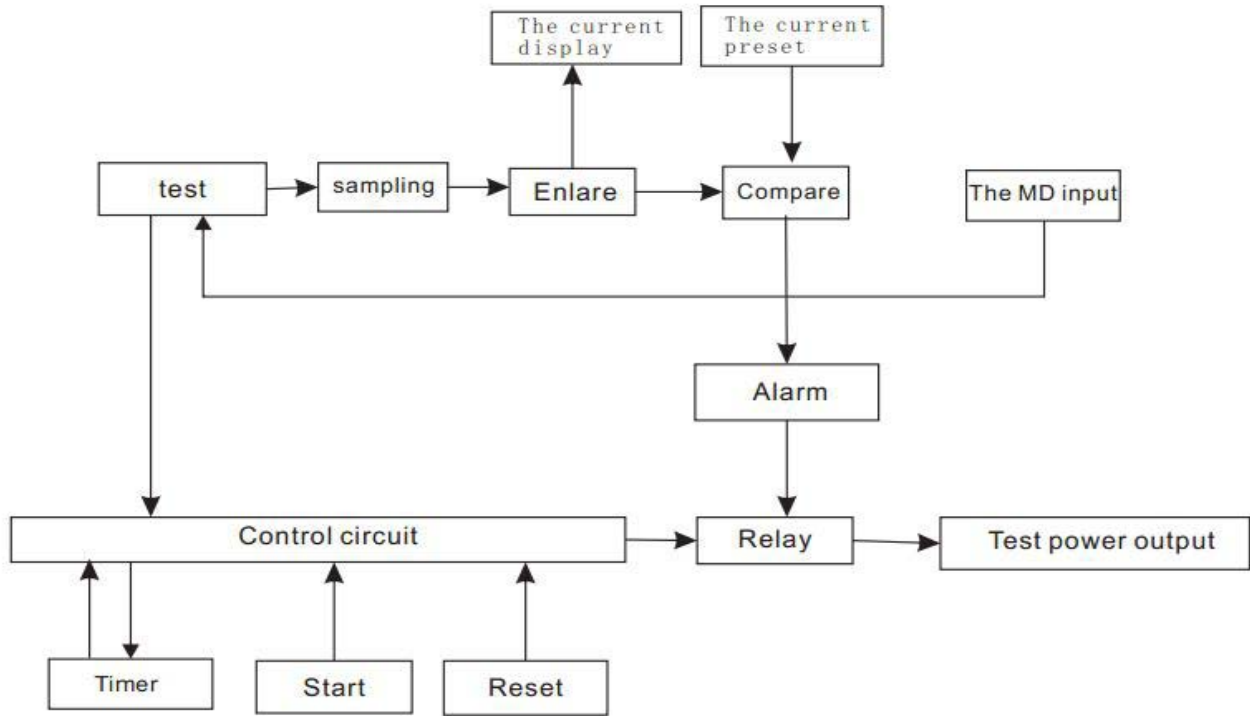
2. Technical specifications

- 1、 output voltage : 0~ 250V $\pm 5\%$ ± 3 digits
- 2、 Leakage current test range : AC/DC 5~ 200 μ A $\pm 5\%$ ± 3 digits
AC/DC 0.2~ 2mA $\pm 5\%$ ± 3 digits
AC 2mA~ 10mA $\pm 5\%$ ± 3 digits
- 3、 Leakage current alarm value : 5~ 200 μ A $\pm 5\%$ ± 3 digits
(can be set up for any alarm value) 0.2~ 2mA $\pm 5\%$ ± 3 digits
2mA~ 10mA $\pm 5\%$ ± 3 digits
- 4、 Isolation transformer capacity : 500VA(CX-2675Y)
(CX-2675Y-1 1KVA)
(CX-2675Y-2 2KVA)
- 5、 Time range : 1~99s $\pm 1\%$, The test can be set for time and manual
- 6、 The working conditions : 0 ~ 40 °C ambient temperature
- 7、 Relative humidity: no more than 75%
- 8、 The atmospheric pressure: 101.25 kpa
- 9、 Power: 220 v + 10% to 50 hz + 2 hz

3. Working principle

Medical leakage current tester is mainly by the test circuit(MD) , scale transform, ac/dc conversion (detection), display module, transfinite alarm circuit and the test of working voltage regulating device. Test loop (MD) completely according to GB9706.1-2007 (IEC60601-1:1988) took "19.4 test e) measuring devices" requirements, in the range transform part can be convenient to users according to the actual load size to choose the appropriate range; Ac/dc conversion part of the ac voltage and current signal into a dc voltage current signal is used to display; Display module test voltage and leakage current and actual test time. Transfinite alarm circuit to complete the alarm and indication of unqualified products and automatically cut off output power; Experiment voltage regulating device can be regulated according to different standards need proper test voltage.

4.Directions for use and operation steps



1. the power switch;
2. start button: when pressed, the test lights , leak test end (power) output voltage;
3. reset button: when pressed, the lights went out , without testing voltage output;
4. measuring devices (MD) input (ground);
5. measuring devices (MD) input terminal;
6. the function of medical electrical equipment grounding to be tested (FE) connection;
7. the medical electrical equipment to be tested protection ground connection (PE);
8. the output voltage, auxiliary port, measure the casing leakage current, patients leakage current choose to use .
9. test power output, providing medical electrical equipment power supply under test;
10. leakage testing for working voltage adjustable , clockwise for big, vice is small;
11. leakage current higher leakage indicator light: this lights for leakage current exceeds preset current test;
12. test status indicator light: this lights said the instrument is in the testing state;
13. voltage unit indicator;
14. voltage value displayed indicating window;
15. the leakage current unit indicator, when lit for " μ A", dies for "mA";
16. leakage current display value indicating window;
17. the test time unit indicator;
18. test time display value indicates the window;
19. leakage current preset adjustment button: when pressed the current switch, adjust current alarm value. Range can be set according to the current '0.005 -2 ma' any dc current alarm value.
20. leakage current test and preset switch: press the leakage current switch, leakage current range and display the leakage current can be set alarm value, when the normal can be measured and display the actual ac and dc leakage current value;
21. leakage current range switch: press is 0-200 μ A, when the pop-up for 2/10 ma;
22. leakage current range switch: press is 0 - 10 ma, pops up is 0 ~ 2 ma
23. the leakage current of ac, dc display switch: press for dc current ,pop up for ac current;
24. time switch: open for any setting in the 1 s - 99 s (the countdown), "off" for manual;
25. time presets dial, can be in 1 s - 99 s set arbitrary regular time;

26. test work voltage, secondary voltage (V2) display switch: press to test working voltage display(power, port voltage), pop up as a secondary voltage (V2) shows (the S9 port);
27. auxiliary voltage (V2) adjusting knob: clockwise for big, whereas for small;
28. measuring devices (MD) input (ground) grounding switch: press said grounding
29. PE connect the grounding switch: press the PE said grounding, pop-up PE disconnect
30. F E connecting the grounding switch: press the FE said grounding, pop-up FE disconnect
31. auxiliary power supply grounding switch: press the grounding, pop-up disconnect
32. auxiliary power supply voltage polarity switch;
33. normal/single fault switch: press as a "normal" pop up for a "single fault state" (working power supply switch);
34. testing power supply polarity switch:(equivalent to GB9706.1 -19.4-b,S5) in the switch power source switching (work).

Steps:

1. Test preparation

- (1) let the instrument on;
- (2) press the start button, adjust the leak test voltage adjusting knob, observe the voltage value displayed indicating window.

Test the high voltage switch to take 110% of the rated voltage, then press the reset button, to cut off the testing voltage;

- (3) in the reset state, to medical electrical equipment power plug is measured with the test of the instrument work output power supply (power) connection, through to medical electrical equipment power supply under test;

- (4) according to the corresponding standard, choose whether to regularly test.

2. Grounding leakage current measurement

Grounding leakage current: By the power grid power supply part through or across the current flowing into the protective earthing conductor insulation.

- (1) leakage current alarm values:
 - A) press the leakage current preset switch;
 - B) according to the corresponding, need to select leakage current test range;
 - C) leakage current adjustment knob to the desired value, the leakage current display window indicates the alarm value set, after setting, press the switch of leakage current preset again in the test state.

- (2) the medical electrical equipment under test (FE) connected to the instrument (FE) are connected, connect the FE the earthing switch is pressed, the FE side grounding;
- (3) measured medical electrical equipment protective earth (PE) and measuring devices (MD) input terminal (the below terminal) connection, measuring unit (MD) input (ground) grounding switch press (the above terminal), make it grounding;The normal/single fault switch press, as a "normal";
- (4) press start button, fine-tuning leak test voltage adjusting knob, the test voltage to the highest rated net voltage 110 %;
- (5) test polarity switch power supply circuit (S5) respectively readout leakage current value;
- (6) press the reset button, to cut off the test voltage, the normal/single fault switch pops up, as the "single fault state";
- (7) press start button, switch test polarity switch power supply circuit (S5) read the leakage current value respectively;
- (8) if the alarm in the testing process, the medical electrical equipment to be tested for floor drain current is too large, is unqualified, press the reset button, will make the device reset.
- (9) meet GB9706.1 figure 16 and figure 17.

3.the exterior leakage current measurements:

Exterior leakage current: when in normal use, from the operator or patient touch exterior or exterior parts (excluding application part), the external electrical connection instead of protective earthing conductor current into the earth or the rest of the exterior.

- (1) leakage current alarm values:
 - A) press the leakage current preset switch;
 - B) according to the corresponding standard, need to choose leakage current test range
 - C) leakage current adjustment knob to the desired value, the leakage current display window indicates the alarm value set, after setted , press the switch of leakage current preset again in the test state.
- (2) the medical electrical equipment under test (FE) connected to the instrument (FE)

terminal, connect the FE the earthing switch is pressed, the grounding FE , measured medical electrical equipment protective earth (PE) and instrument protection ground connection (PE) connection end, connect the PE the earthing switch is pressed, the PE side grounding (I such equipment) ;For II such equipment without PE connection.

(3) medical electrical equipment and instrument signal input/output interface integrated corresponding connection with S9. Press S9, auxiliary voltage output, when the S9 pop-up, port grounding, please send button pop-up when connection or not; When using the voltage adjusted to 110% of rated power grid voltage;

(4) exterior of equipment and measuring devices (MD) input terminal (the below terminal) connection, measuring unit (MD) input (grounding, the above terminal) switch press , make the it grounding;

(5) press start button, fine-tuning leak test voltage adjusting knob, 110% to the highest rated voltage test voltage;

(6) switch test polarity switch power supply circuit (S5) respectively readout leakage current value;

(7) reset button, to cut off the test voltage, the normal/single fault switch pops up, as the "single fault state";

(8) press start button, switch power supply circuit polarity switch (S5) respectively readout leakage current value;

(9) if the alarm in the process of test, the measured medical electrical equipment exterior leakage too large, is unqualified, press the reset button, will make the device reset.

(10) if measured medical electrical equipment part of the exterior is made of insulating material, must be the most large area is 20 cm × 10 cm metal foil against on the insulation of the insulating exterior or exterior parts as a conductor.

(11) conforms to GB9706.1 figure 18, figure 19.

4. patient leakage current measurement :

- (1) the medical electrical equipment under test (FE) connected to the instrument (FE) are connected, press (FE) the earthing switch, connect FE on the ground, tested for medical electrical equipment protective earth (PE) and instrument protection ground connection (PE) connection, press (PE) the earthing switch, the PE side grounding (I equipment);For II, such equipment without PE connection.
- (2) medical electrical equipment part of the output and measurement instrument measuring device (MD) input terminal (below terminal) Connection, measuring unit (MD) input (grounding) switch press (above terminal), make the ground.
- (3) choose whether to need to secondary voltage access;
- (4) choose the current measurements, using ac/dc current switch switch;
- (5) leakage current alarm values:
 - A) press the leakage current preset switch;
 - B) according to the corresponding standard, need to choose leakage current test range;
 - C) leakage current adjustment knob to the desired value, the leakage current display window indicates the alarm value set, set to end, press the switch of leakage current preset again in the test state.
- (6) press start button, fine-tuning leak test voltage adjusting knob, the test voltage adjusted to 110% of rated power grid voltage;
- (7) switch test polarity switch power supply circuit (S5) respectively readout leakage current value;
- (8)Reset button, cut the test voltage, the normal/single fault switch pop up, for a "single fault state";
- (9) start button, switch test polarity switch power supply circuit (S5) respectively readout leakage current value;
- (10) in the process of the test report to the alarm, the patients medical electrical equipment to be tested the leakage flow is big, is unqualified, press the reset button, will make the device reset.

(11) when it comes to measuring the application of some patients with external voltage caused by the leakage current, instrument measuring device (MD) input (grounding) switch pops up, make open circuit.concatenated (MD) between the external voltage and application part . According to the article 19.4 in GB9706.1 measurement.-

(12) when the signal is measured by the external voltage on the input or output interface part from the application to the patients caused by leakage current, the signal must be connected to the input/output interface part of the instrument of the integrated (S9) corresponding port;Other connection above 4. 4. (1) --4. (10) to measure the patient leakage current.

(13) conforms to GB9706.1 figure 20, 21, figure 22, figure 23, figure 25.

5.Patients auxiliary leakage current measurement

(1) choose the current measurements, using ac/dc current switch ;:

(2) setting alarm leakage current

A) press the leakage current preset switch;

B) according to the corresponding standard, need to choose leakage current test range;

C) leakage current adjustment knob to the desired value, the leakage current display window indicates the alarm value set, set to end, press the switch of leakage current preset again in the test state

(3) the medical electrical equipment under test (FE) connected to the instrument (FE) are connected, connect the FE the earthing switch is pressed, make FE grounding , measured medical electrical equipment protective earth (PE) connected to the instrument protection grounding (P E) end connection, connect the PE of the grounding switch is pressed, the PE side grounding (I equipment);

(4) according to the different medical electrical equipment, according to the provisions of the article GB9706.1-19.4 j , measure device (MD) input and tested the application of medical electrical equipment part connection;Measuring devices (MD) input (ground, above terminal) the corresponding ground button press.

- (5) press start button, fine-tuning leak test voltage adjusting knob, the test voltage to the highest rated power grid voltage 110 %;
- (6) switch test polarity switch power supply circuit (S5) respectively readout leakage current value;
- (7) reset button, to cut off the test voltage, the normal/single fault switch pops up, as the "single fault state";
- (8) start button, switch power supply polarity switch (S5) respectively readout leakage current value;
- (9) in the process of the test report to the alarm , the patients medical electrical equipment under test auxiliary leakage flow is big, is unqualified, press the reset button, will make the instrument reset;
- (10) conforms to GB9706.1 figure 26, 27

6. timing test:

- (1) time switch is open, dial the preset time dial, set the test of time.
- (2) press the start button and enter the leakage current test status, test the light instrument timer to timing at the same time, when the time display is zero test lights put out, tested body is qualified; If leakage current exceeds the set alarm value, the instrument automatically cut off the testing work voltage, leakage test the lights put out at the same time, super light bright, buzzer noise tested body is unqualified, press the reset button, can clear the alarm.

Note: measure the leakage current measurement is charged, measured electrical external can be charged, as a result, the tester must pay attention to safety, formulate corresponding safety operation procedures, before not to cut off the power supply, must not touch the electric equipment to be tested, to prevent electric shock, danger!

5. Using the matters needing attention

- 1, the operator must read the GB9706.1-2007 about the provision and operation instruction before use .
- 2, the operator must wear insulating rubber gloves: foot pad insulation rubber pad: to prevent electric shock life-threatening.
- 3, when connection , must ensure that the output voltage for the "0" and the "reset" state.
- 4, auxiliary voltage output port have voltage, (introduced to 29) adjust twist the backward rotation to minimum or the S9 upspring
- 5, not let the output ground wire and the ac power cord short circuit, so as to avoid the external with high pressure and dangerous.
- 6, once the test lamp, super light leakage damage must be replaced immediately in case of wrong result.
- 7, medical electrical equipment under test , power not be greater than the power consumption (CX-2675Y 500 va, CX-2675Y- 1 1 kva), otherwise it will damage to the overload of built-in test power supply.
- 8, instruments and avoid direct sunlight positive, do not use in high temperature and humid and dusty environment and storage.
- 9, instrument using a year later, must be measured in accordance with national technical supervision department needs to send department or back to the factory after verification qualified, can continue to use.

6. Calibration

- 1, CX-2675Y series medical leakage current tester is composed of test power supply and measuring devices (MD), must by the professional and technical personnel for calibration and maintenance.

2, the output voltage calibration:

(1) the digital meter and CX-2675Y series medical leakage current tester to test the power supply output connection;

(2) make sure the regulator output as "0" press the start button, slowly adjust voltage regulator to rise voltage, based on the 200 v, the rest of the calibration point is 100 v, 150 v, 250 v.

(3) the above output voltage indication error of 5%, if not in scope, adjust potentiometer W6 (VOL) to the index requirements.

3. Leakage current calibration

(1) digital ammeter concatenated current-limiting resistor, joint CX-2675Y medical leakage current tester test under the power supply output terminal, the other end connect measurement device (MD) input terminal (below), and press measuring devices (MD) input the earthing switch (above);

(2) the instrument in a reset state, voltage regulating knob counterclockwise spin, leakage current selection switch on 2 ma file (2 ma to calibrate leakage current benchmark);

(3) press the start button, slow adjustment test voltage adjustment knob to make digital ammeter indication in 0.5 mA, if not in 0.5 mA, adjustable potentiometer W4 (2mA), to refer to 0.5 mA;

(4) and slow adjustment test voltage adjustment knob to make digital ammeter indication in 1 mA, 1.9 mA, its indication error should be less than or equal to 5%;

(5) leakage current selection switch on the 200 μ A file, replace the current limiting resistor, slow adjustment test voltage adjustment knob to make digital ammeter indication 50 μ A, if not in 50 μ A, adjust potentiometer W1 (200 μ A), make it up to point to 50 μ A;

(6) slow adjustment test voltage adjustment knob to make digital ammeter refers not to 100 μ A, 190 μ A, its indication error should be less than or equal to 5%;

(7) put leakage switch selector 10mA file, replace the current limiting resistor, slow adjustment test voltage adjustment knob to make digital ammeter indication in 5 ma, if not in 5 ma, adjustable potentiometer W2 (10mA), to refer to 5 ma.

(8) and slow adjustment test voltage adjustment knob to make digital ammeter refers is not to 10 ma, its indication error should be less than or equal to 5%;

(9) current limiting resistor values should be in accordance with the 200 v present calibration current full value, and pay attention to the power of resistance.

(10) dc current calibration is after in alternating current calibration , put 200 μ A leakage current selection switch gear, input dc current digital ammeter indication 50 μ A, if not in 50 μ A, adjust potentiometer project W8(total - mA), to refer to 50 μ A;

(11) to adjust the current digital ammeter indication in 100 μ A, 190 μ A, its indication error should be less than or equal to 5%.

7.The attachment

Attachment:

The power cord	1
Test line	1
specification	1
warranty	1
certificate	1