

preface

Before using this instrument, please read the instructions in detail. In order to make you operate the instrument skillfully as soon as possible, we have randomly equipped with detailed instructions, which will help you to use the product better. You can get the knowledge about the product introduction, use method, instrument performance, and safety precautions.

When writing this manual, we are very careful and rigorous, and believe that the information provided in the manual is correct and reliable, but it is inevitable that there will be mistakes and omissions. Please include more and welcome your corrections.

Our purpose is to continuously improve and perfect the company's products, while we reserve the right to improve and upgrade the use function of the instrument. If you find that the function of the instrument is not completely consistent with the one described in the instructions, please refer to the actual function of the instrument. If you find any problem in the use of the product, please contact us in time! We will try our best to provide perfect technical support!

In order to facilitate your use, we will introduce the company's transformer characteristic parameters- -transformer short-circuit impedance, transformer capacity analysis, transformer loss parameters and other related test instructions together. Please note the actual product features you purchased and refer to the relevant sections.

This instrument is limited to the measurement of alternating current, can not measure direct current.

Instrument Catalogue

1. INSTRUMENT OVERVIEW	4
2. MAIN FUNCTIONS OF THE INSTRUMENT	4
3. MAIN TECHNICAL INDICATORS OF THE INSTRUMENT	4
4. INSTRUMENT PANEL AND FUNCTION INTRODUCTION	5
5. MAIN INTERFACE	5
VI. PARAMETER SETTING	6
.....	8
.....	8
.....	8
.....	11
.....	20
VIII. OPERATION INSTRUCTIONS OF TRANSFORMER LOAD LOSS TEST	23
.....	23
.....	25
.....	34
9. OPERATION INSTRUCTIONS OF TRANSFORMER SHORT-CIRCUIT IMPEDANCE TEST	35
TRANSFORMER	35
.....	37
.....	46
IX. MEASUREMENT OF THE ZERO-ORDER IMPEDANCE	49

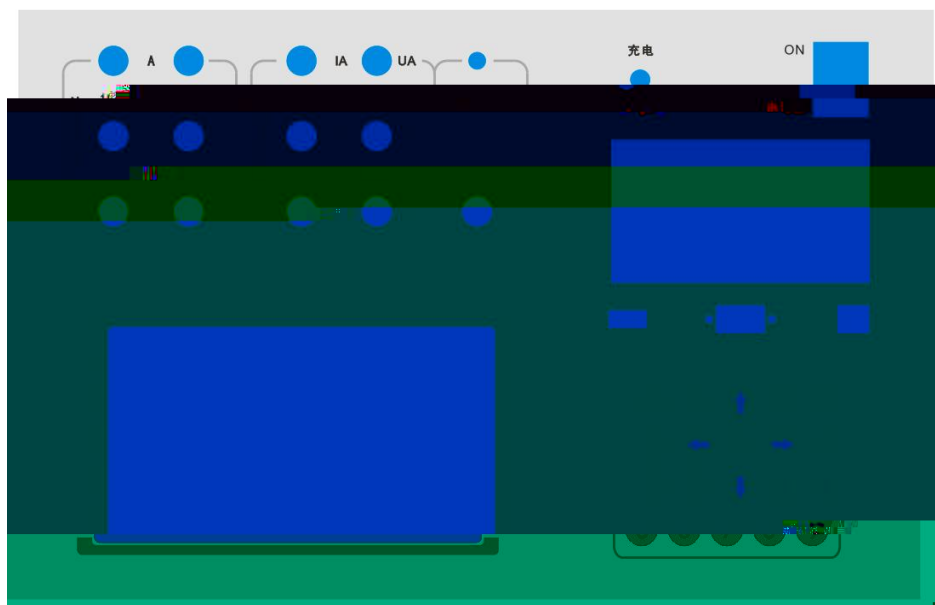
18. ACCESSORIES (PACKING LIST)	60
19. AFTER-SALES SERVICE	60
APPENDIX 1 COMMON FAILURES AND ANALYSIS OF THE INSTRUMENT	61
APPENDIX II DETERMINATION OF TEST POWER SUPPLY CAPACITY DURING NO-LOAD LOSS TEST	61
APPENDIX 3 LOAD LOSS, SHORT CIRCUIT IMPEDANCE, CAPACITY ANALYSIS, AND DETERMINATION OF TEST POWER SUPPLY CAPACITY DURING TEST	61
APPENDIX IV	62

1. Instrument overview

T

4. Instrument panel and function introduction

The panel layout is shown in the figure: the instrument model, packaging is different, the panel is slightly different.



5. main interface



graph 3

Vi. Parameter setting



High voltage direct resistance: DC resistance of high voltage side winding in m Ω.

Low voltage direct resistance: DC resistance of low voltage side winding in m Ω.

Temperature coefficient: resistance temperature conversion coefficient K, related to the transformer winding

material, copper K=, aluminum K=.

$$K = \frac{\zeta_{\text{شروط}}}{\zeta_{\text{شروط}}^{4/3}} \frac{225+T}{225+t}$$

参数设置								返回
变压器类型	无励磁调压				有载调压			
	损耗水平代号							
油浸式 电工钢带	S9	S10	S11	S12	S13	S14	S20	
	S22		D9	D10	D11	D12	D13	
油浸式 非晶合金	SH15	SH16	SH21	S25		DH15		
干式 环氧树脂	SCB9	SCB10	SCB11	SCB12	SCB13	SCB14	SCB15	
干式 非晶合金	SCBH15	SCBH16	SCBH17	SCBH19				
立体卷铁心	S13-RL	SCR11-RL		SCR12-RL		SCR13-RL		

Testing under the rated conditions

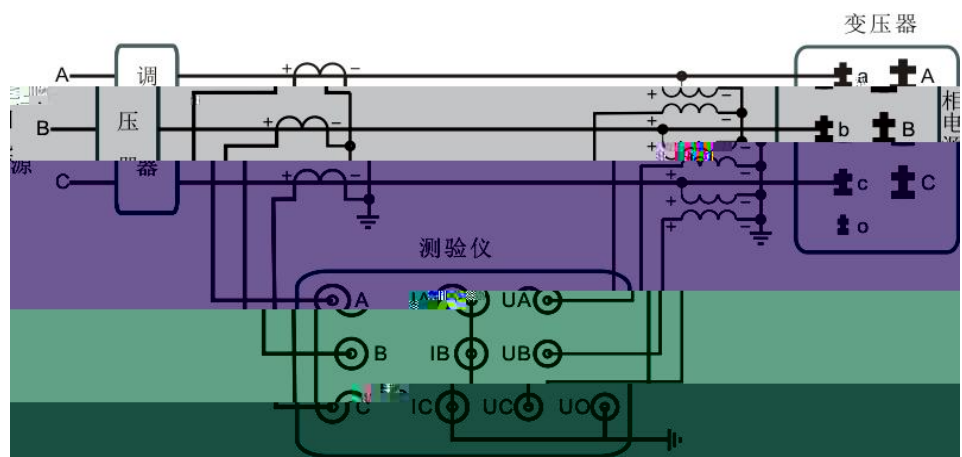
Testing in non-rated conditions

E

Test requirements and attention

If the winding of the applied voltage is split, the tap switch shall be in the main tap position; if the test winding, it shall be closed. In operation, the ground potential, line end, and shell shall be reliably grounded.

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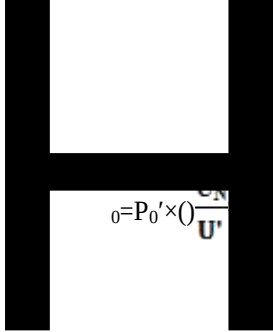


三相空载损耗							返回
设定参数:							
容量: 30.0kVA 锁定电压: 0.400kV 频率: 50.0Hz 空损指数: 2.000							
测试参数:							
	电压平均值	方均根值	差值	电 流	频 率	有功功率	
A	0.00V	0.00V	0.00%	0.000A	0.000Hz	0.000W	
B	0.00V	0.00V	0.00%	0.000A	0.000Hz	0.000W	
C	0.00V	0.00V	0.00%	0.000A	0.000Hz	0.000W	
P	0.00V	0.00V	0.00%	0.000A	0.000Hz	0.000W	



test parameter:

$$\frac{I_a + I_b + I_c}{3I_N} \times \frac{U_N}{U'} \times 100\%$$



$$P_0 = P_0' \times \left(\frac{U}{U'} \right)^{2.5}$$

$$P_0 \times \left(1 + \frac{U' - U}{U'} \right) \times \left(\frac{f_0}{f} \right)^{0.5} \times \left(\frac{f_0}{f} \right)^{0.5}$$

N. No-load loss index

U'- -voltage mean U- -voltage root Rvalue

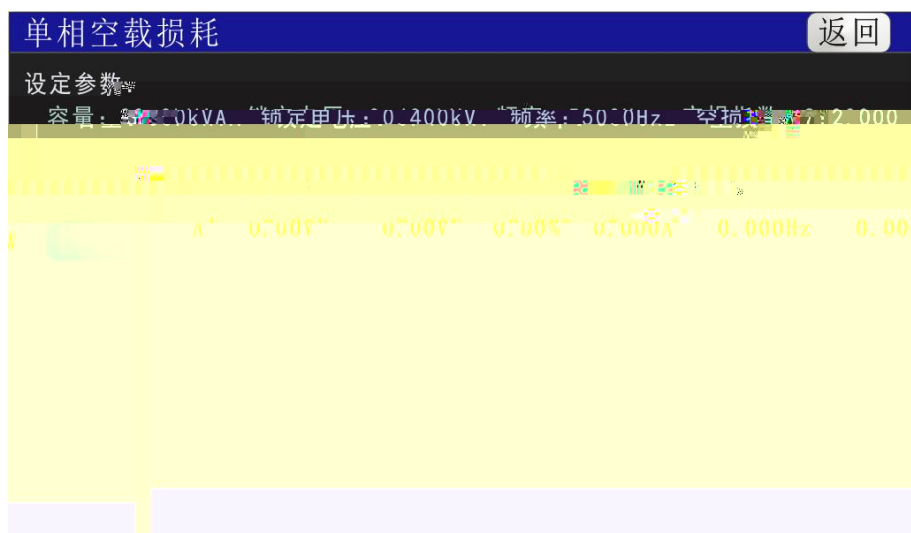
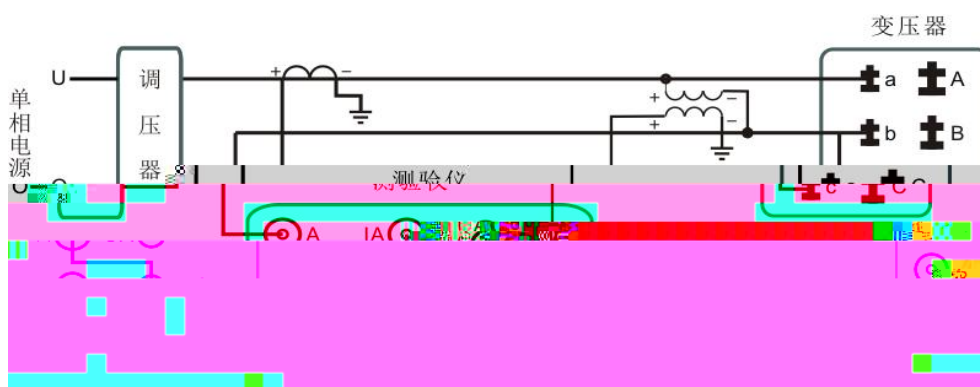
The ratio of P1-hysteresis loss to total core loss is 0.5

P2--The ratio of the eddy current loss to the total core loss is 0.5

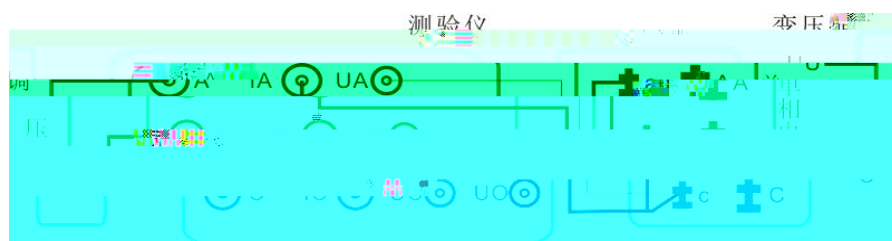
f_n--Transformer rated frequency

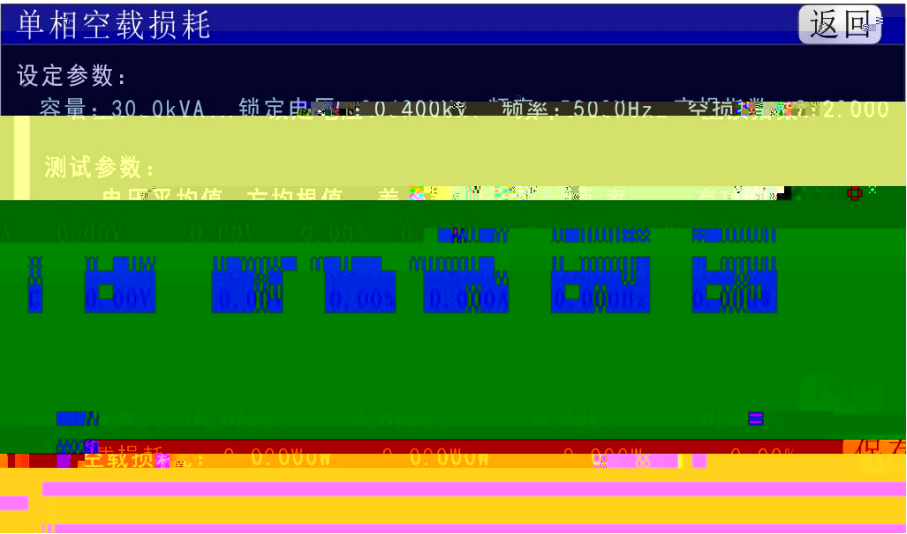
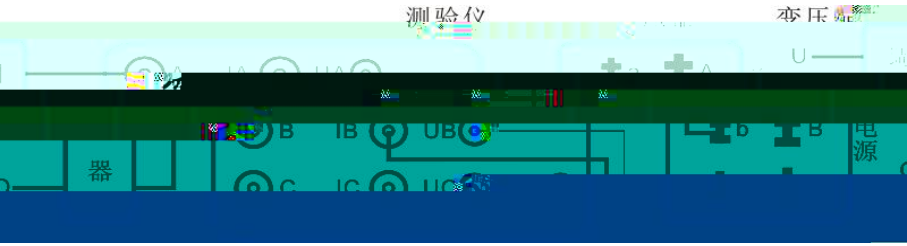
fThe frequency of ovulation test

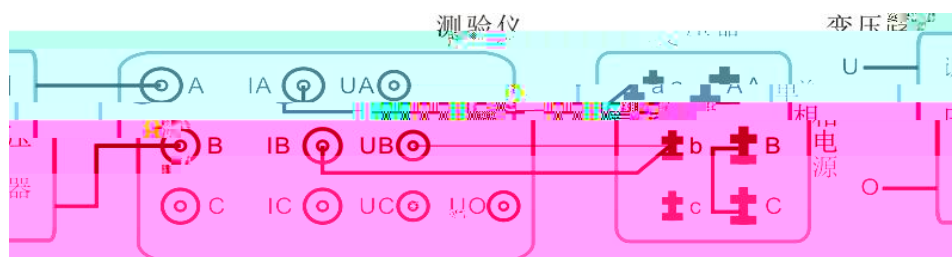
$$P_0' - P_0) / P_0$$

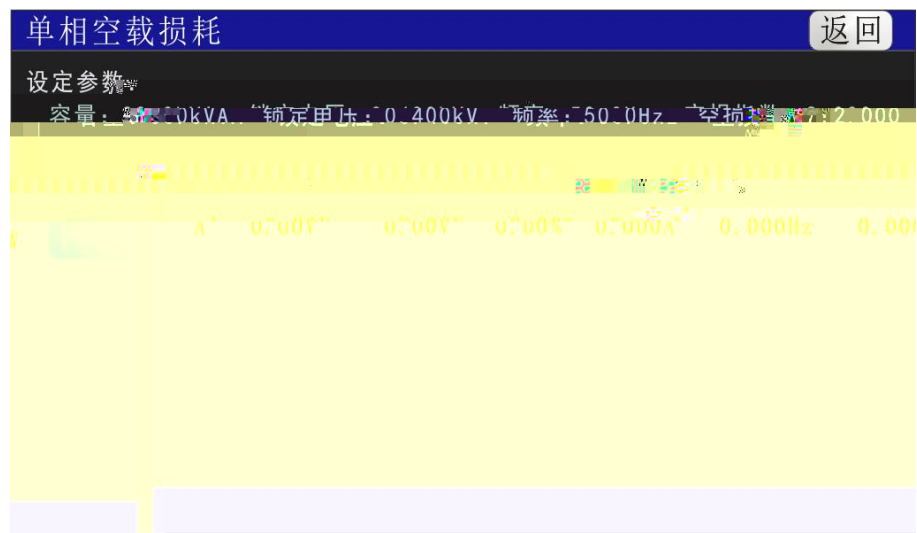
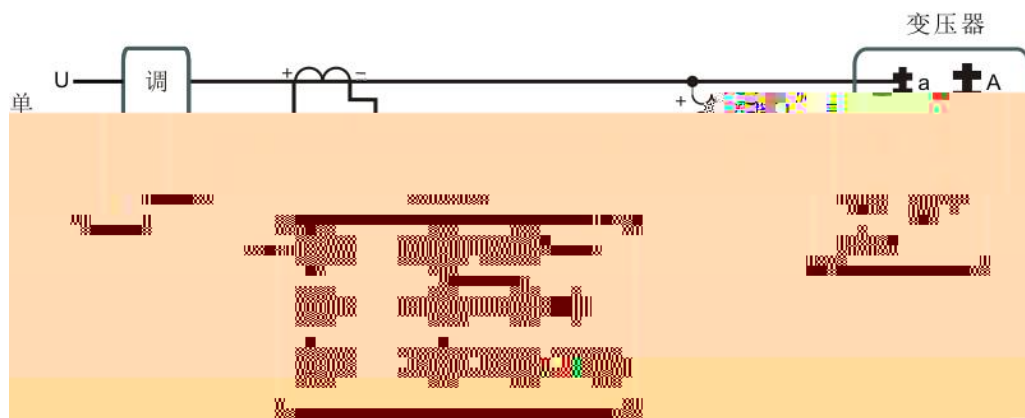


V5€ P



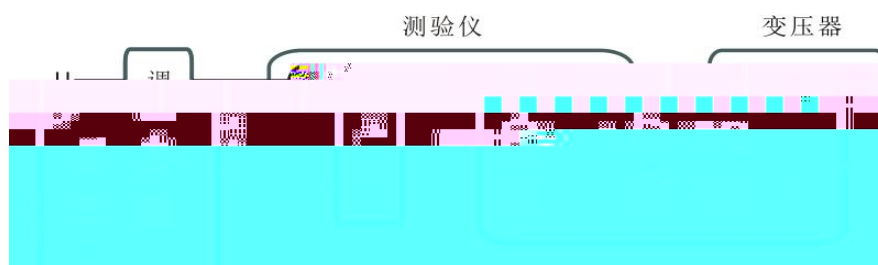




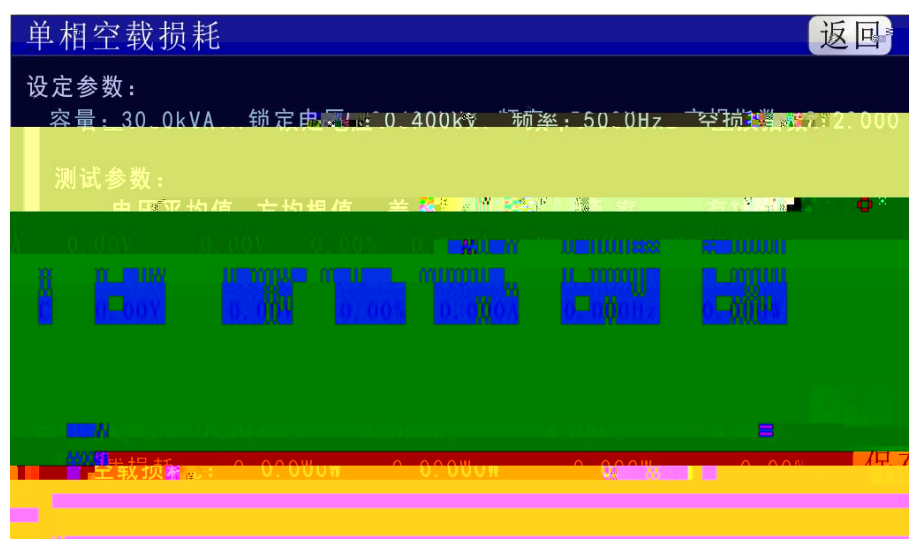


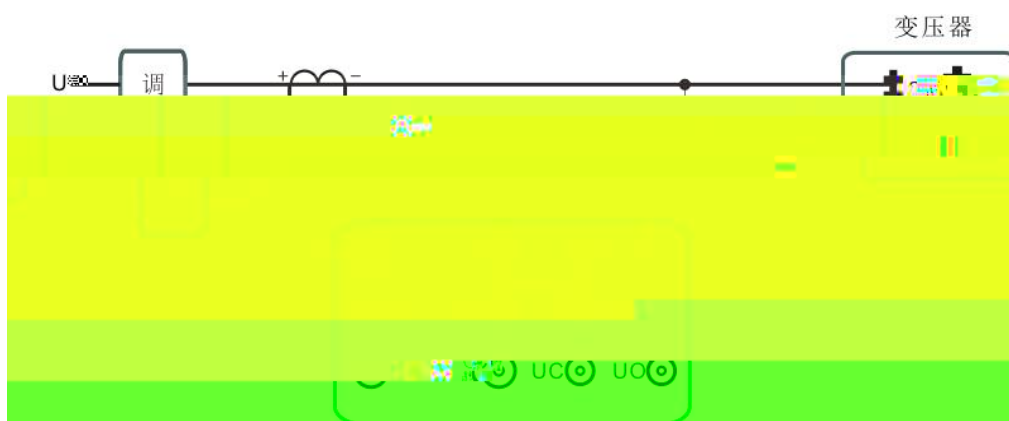
$\sqrt{3}$



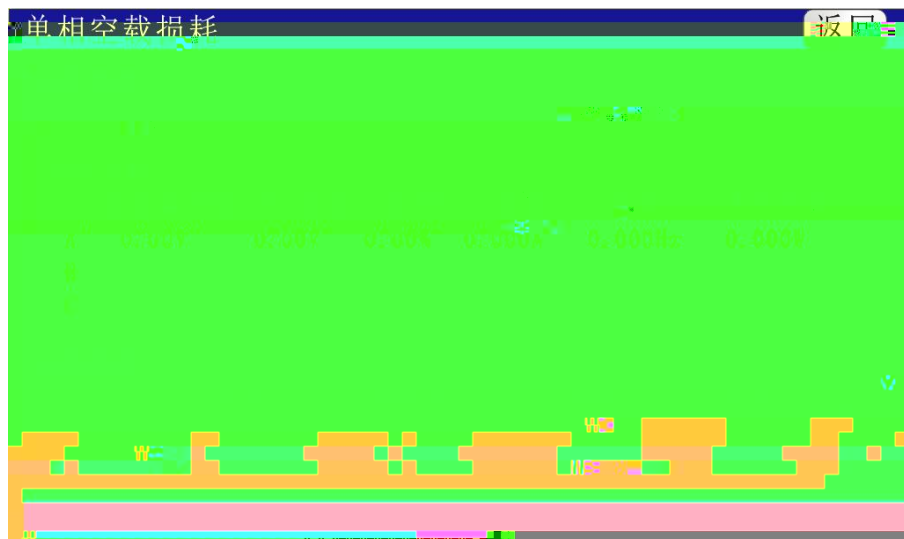


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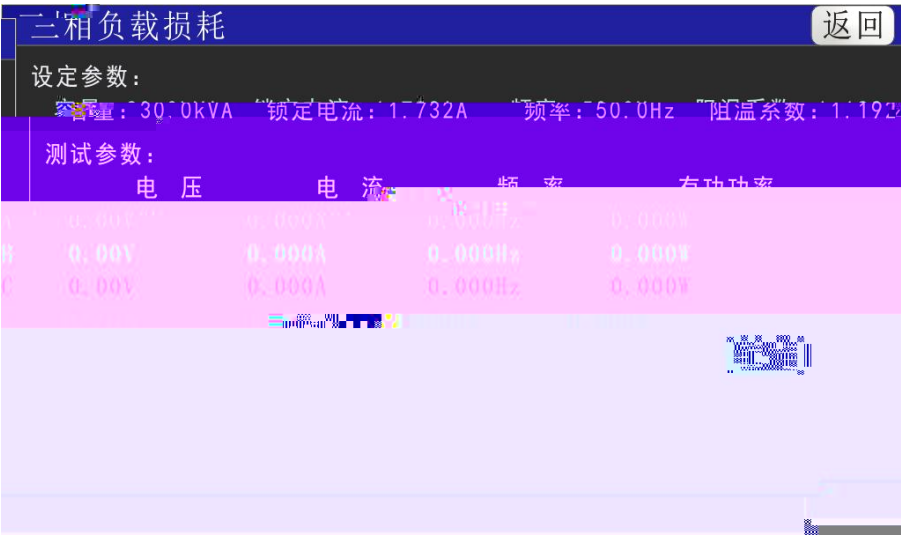




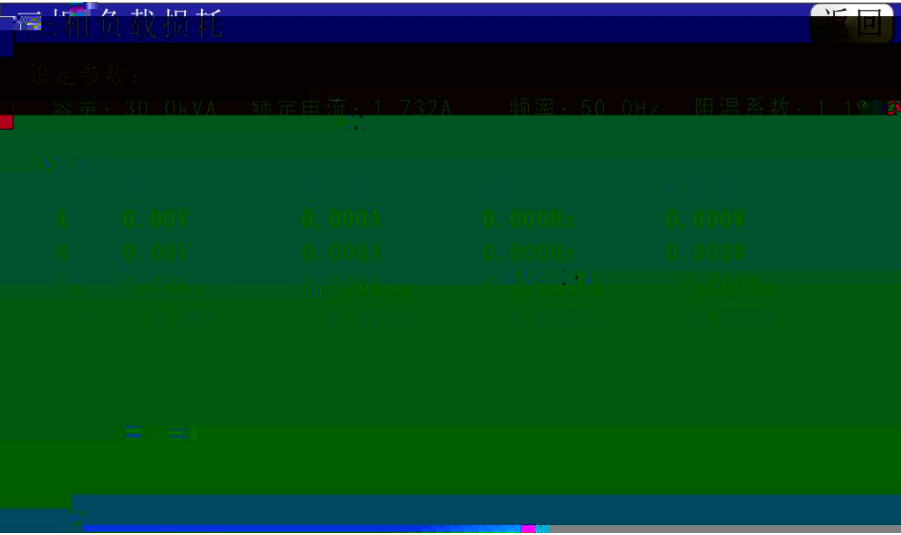


On a...
Testing under... conditions

Testing in non-rated conditions

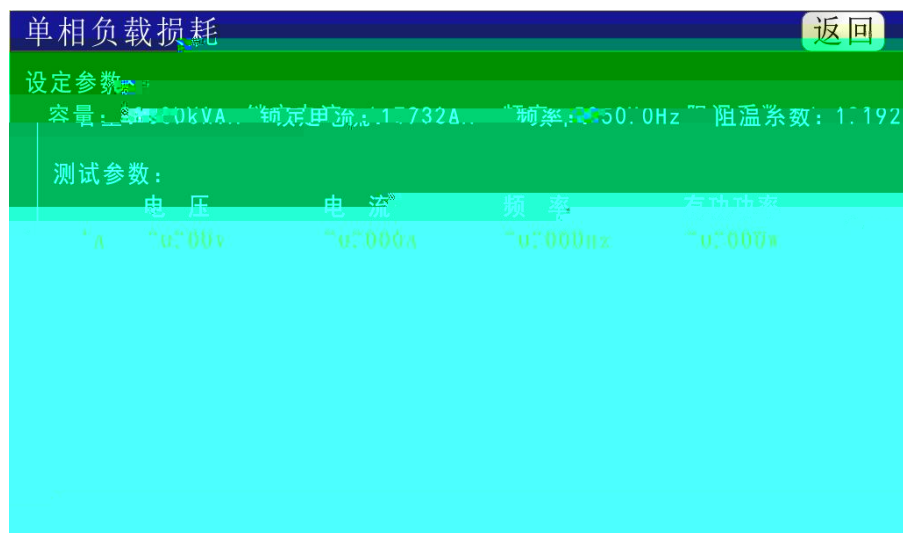


graph 33

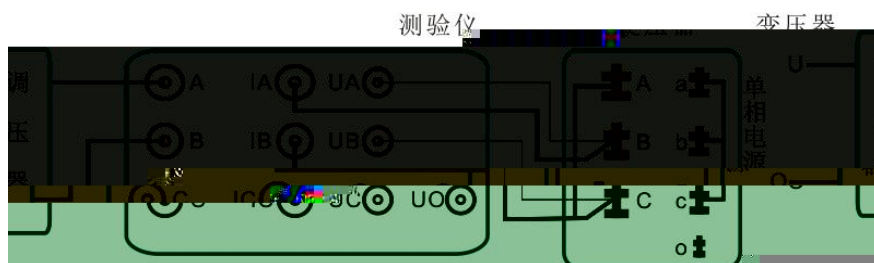


graph 34

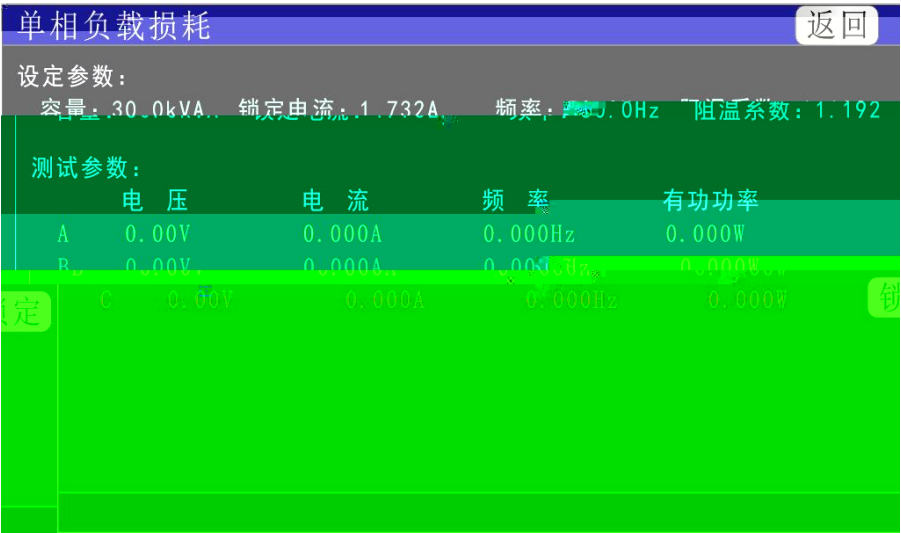
$$N=S_N/(U\sqrt{3}I_N)$$



graph 36

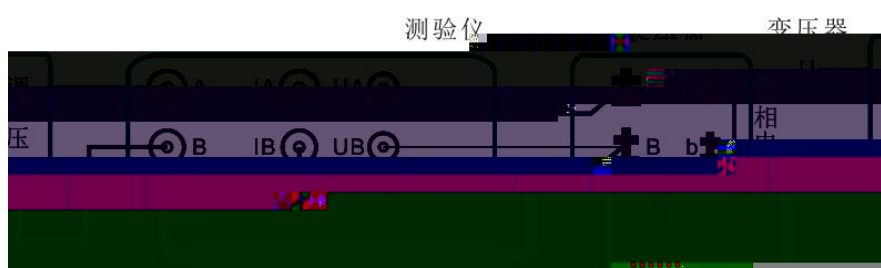
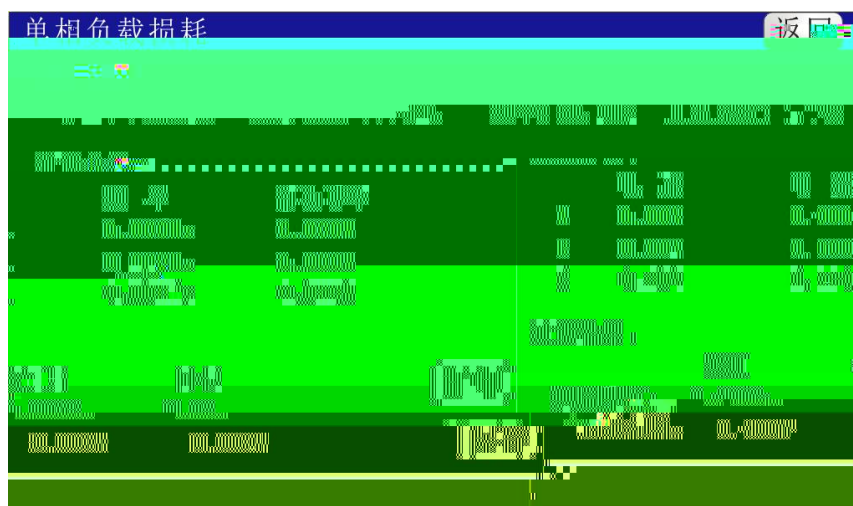


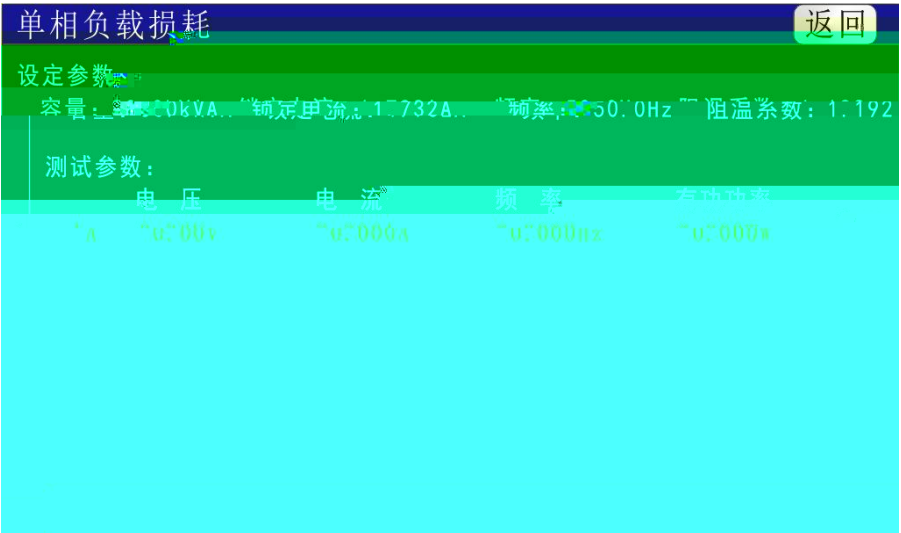
graph 38



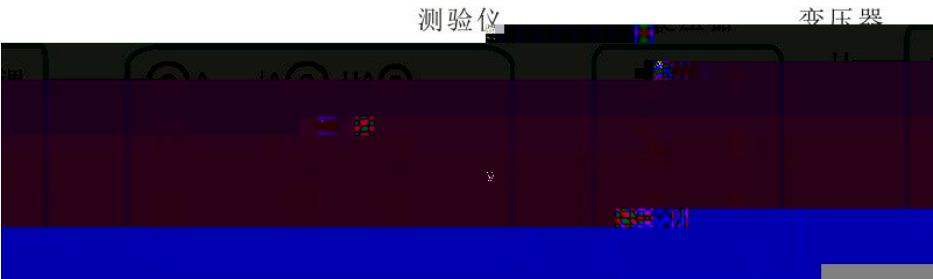
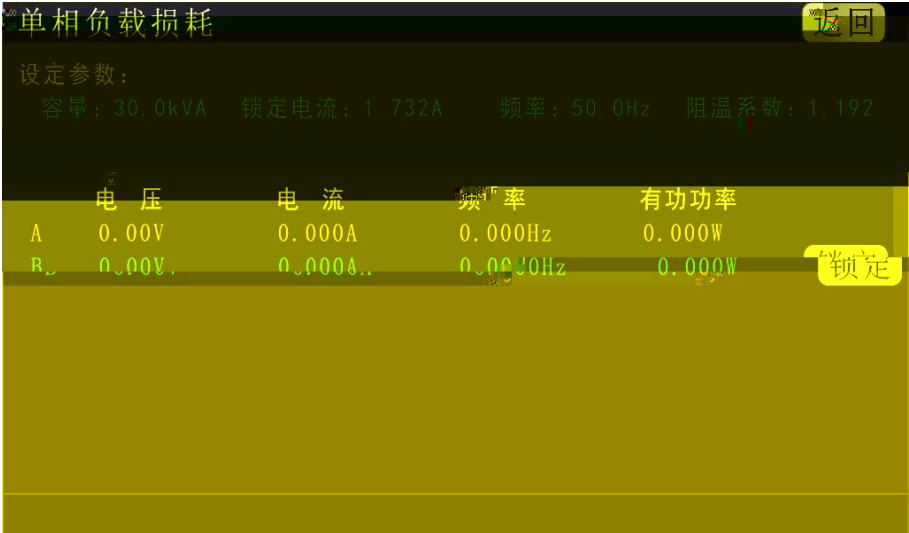
graph 39

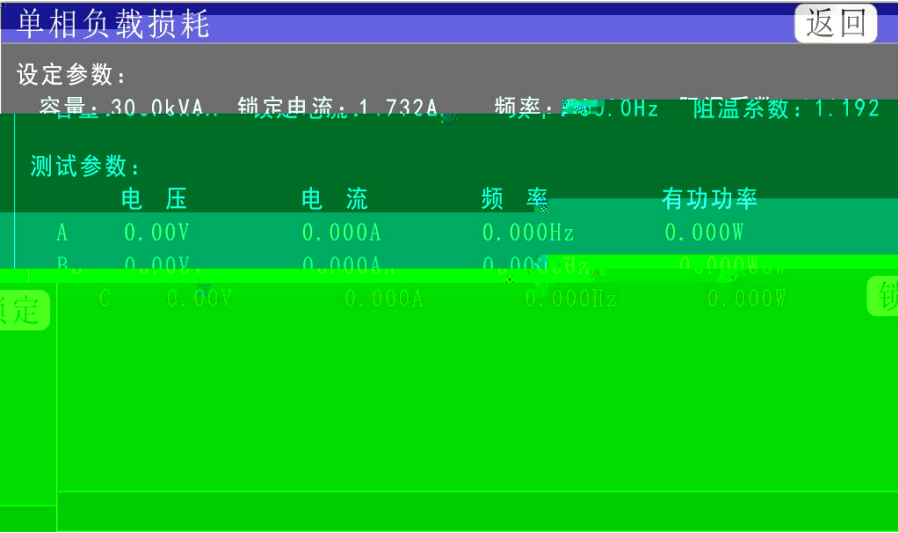




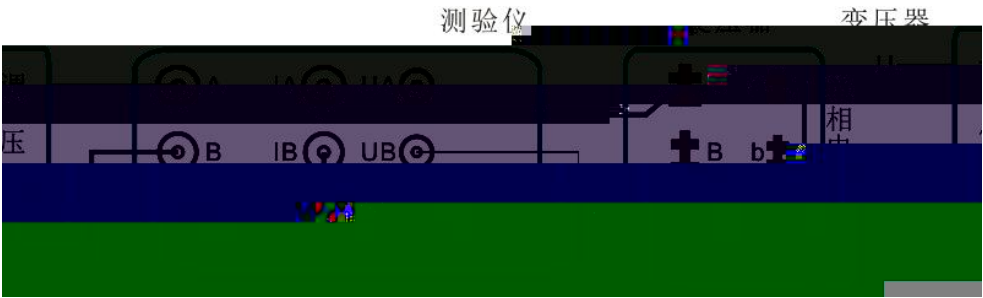


graph 43

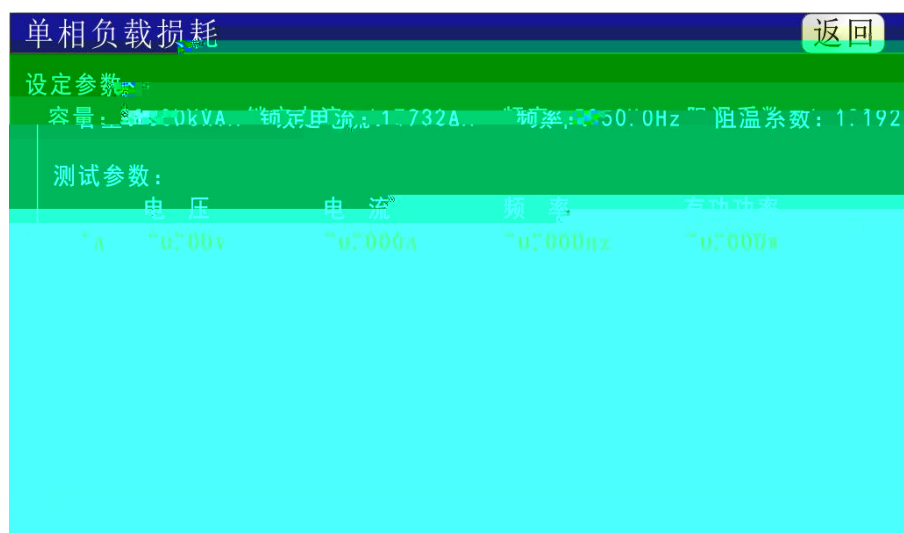




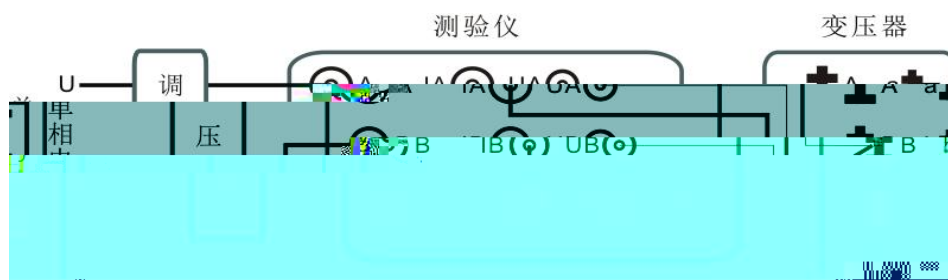
graph 46

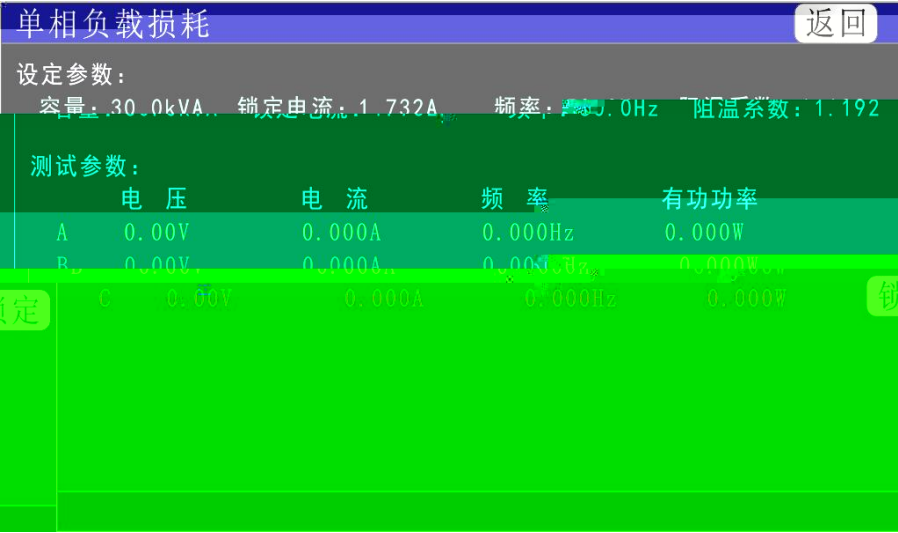


graph 47

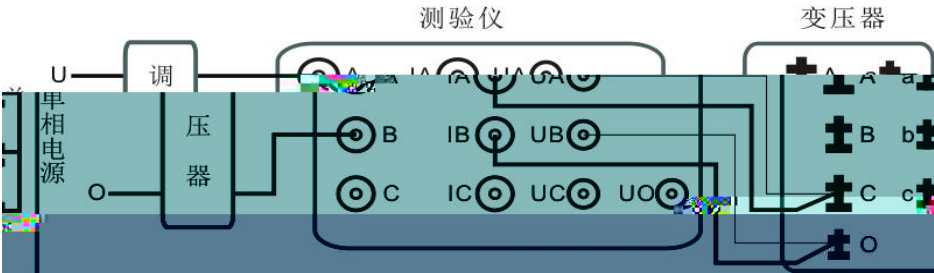


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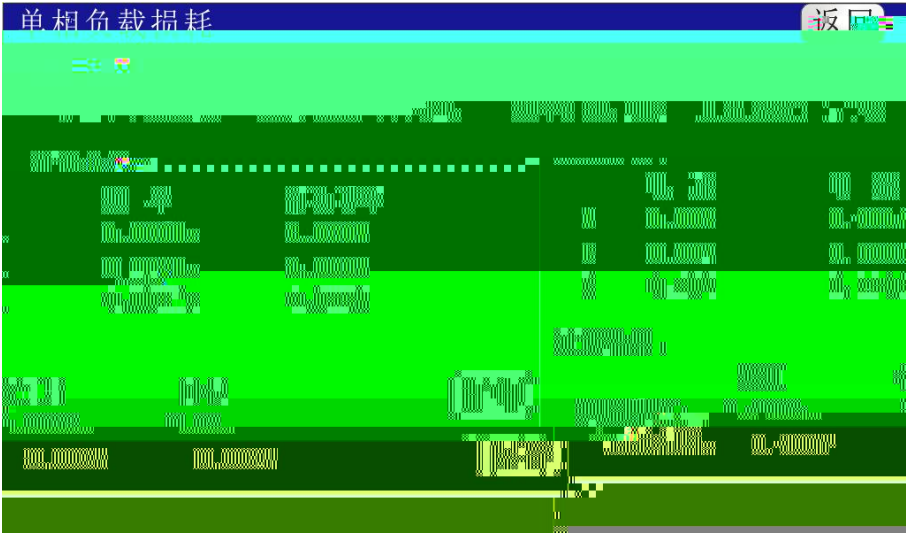


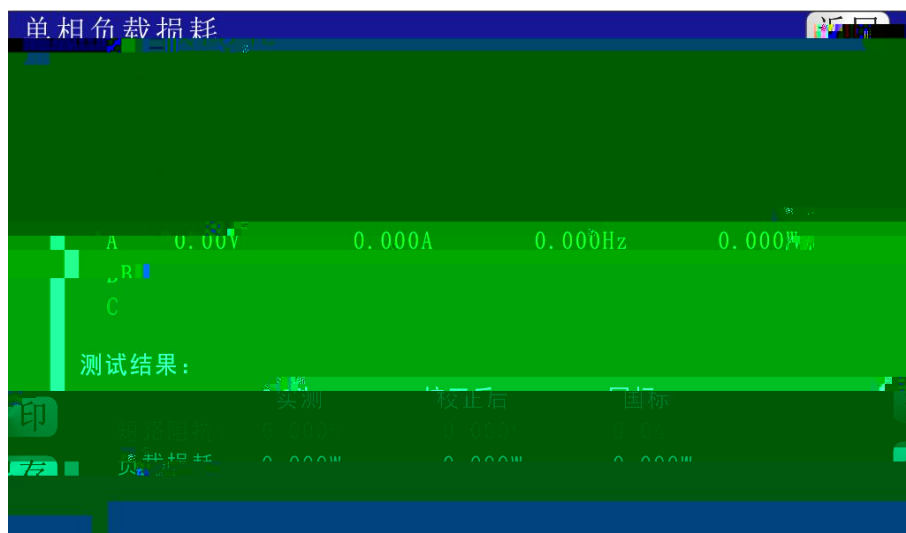


graph 53



graph 54





9. Operation instructions of transformer short-circuit impedance test

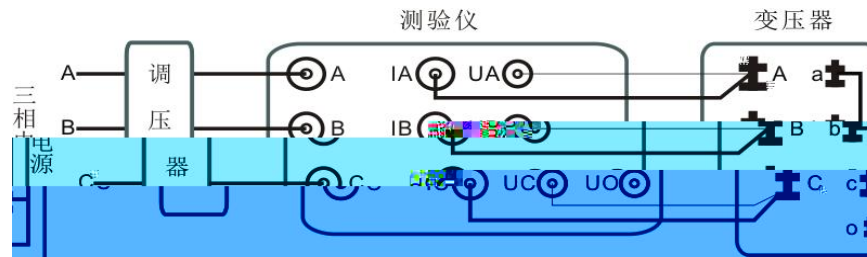
Testing under the rated conditions

Testing in non-rated conditions

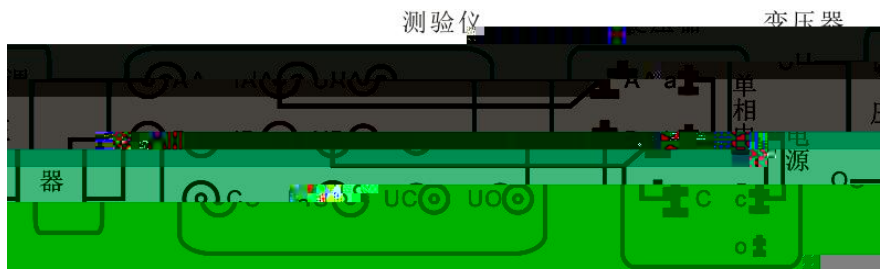
Test requirements and attention

(Note: Three-phase transformers have the same

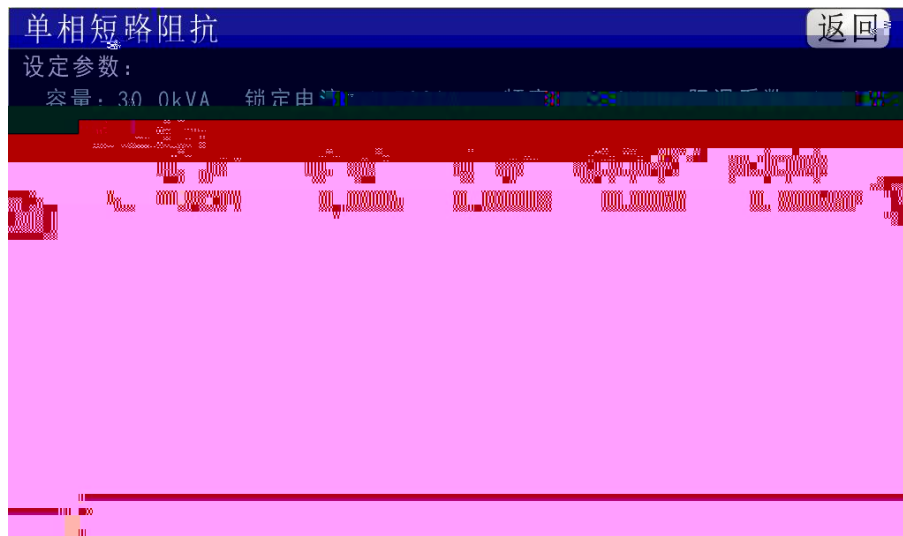
test wiring mode during the three-phase test.



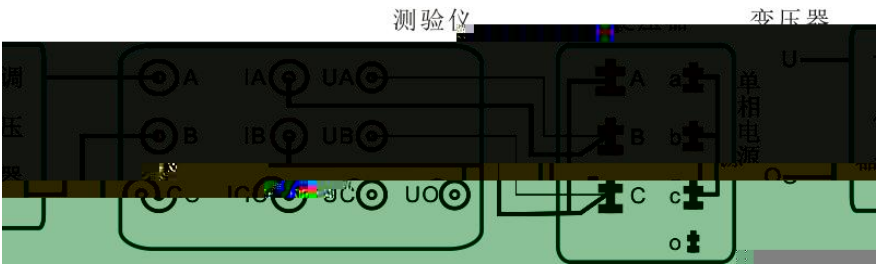
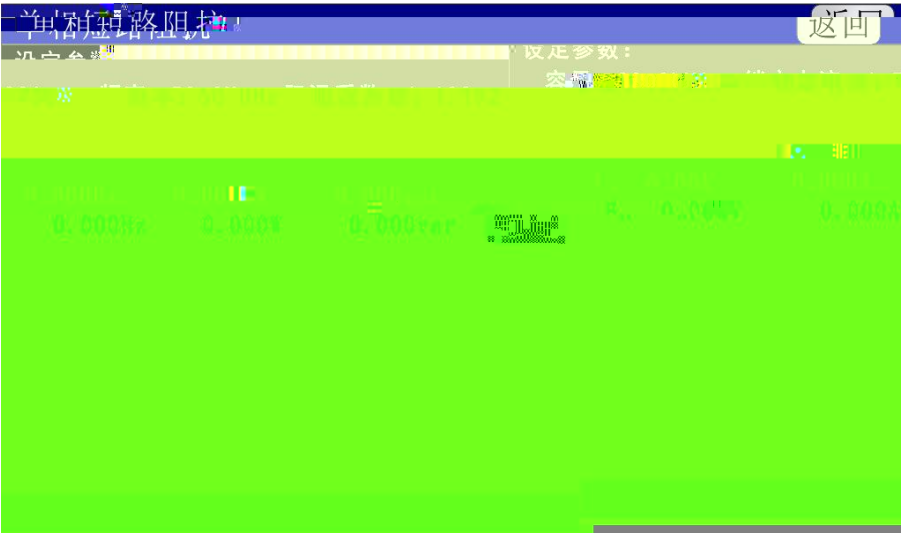
graph 59



graph 62



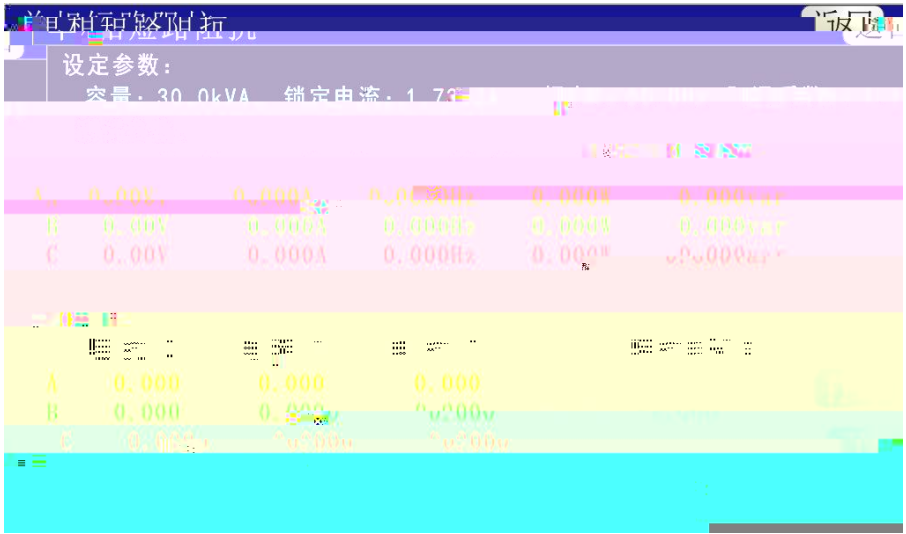
graph 63

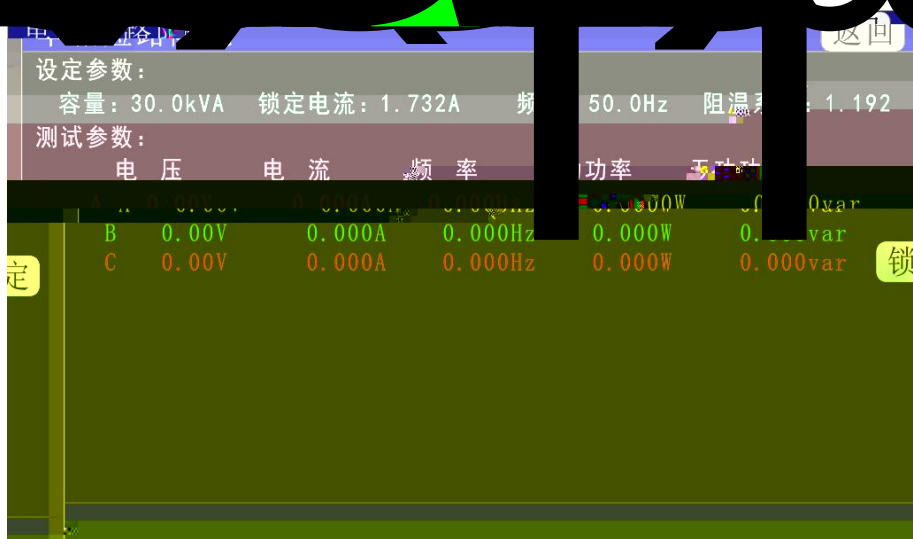


graph 65

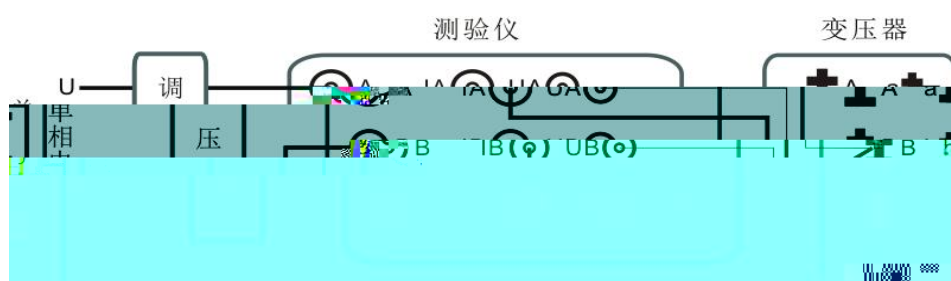


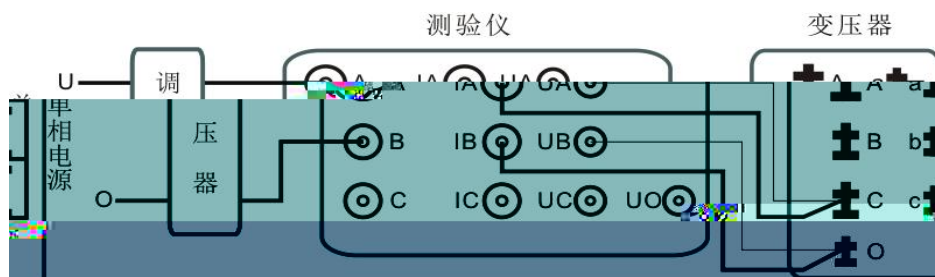
graph 66



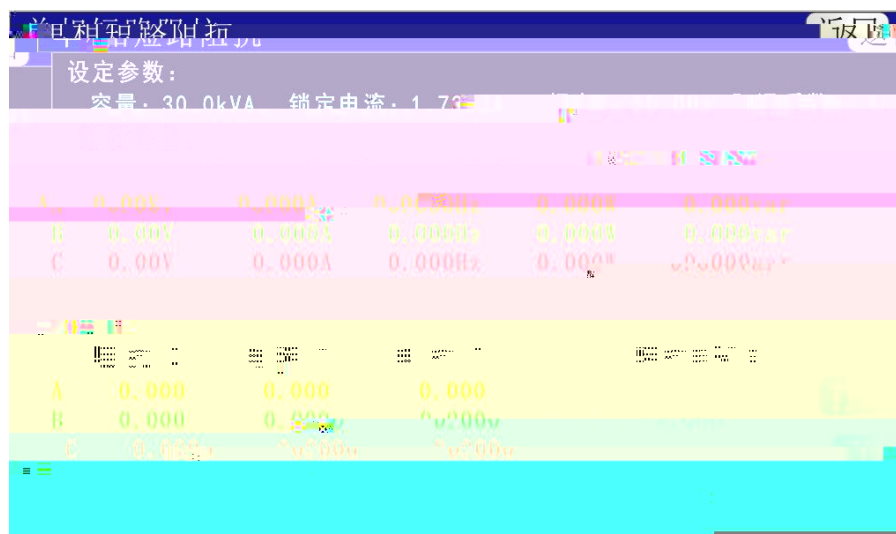


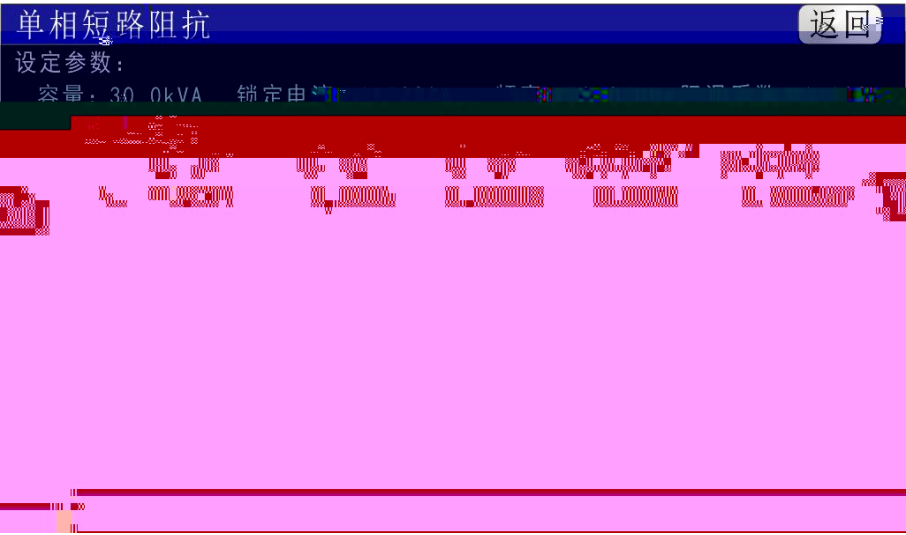
graph 73





graph 81

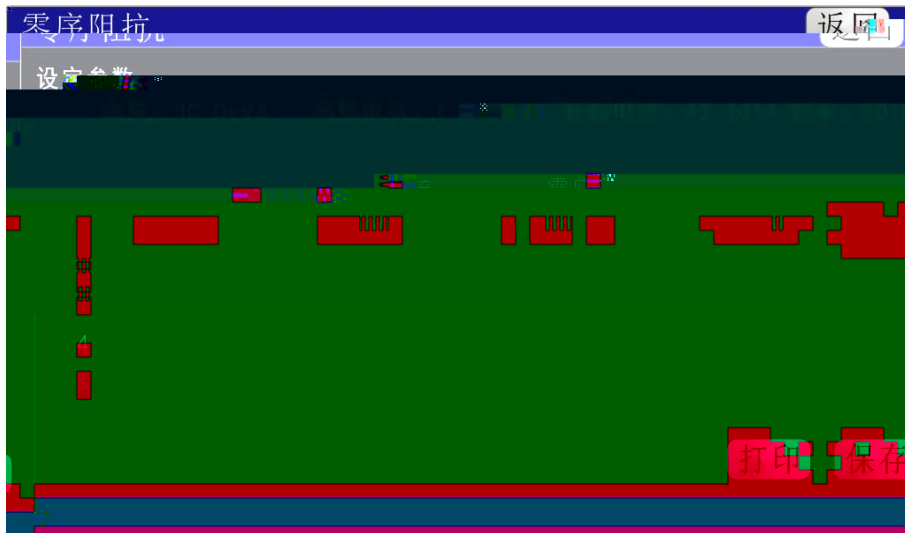


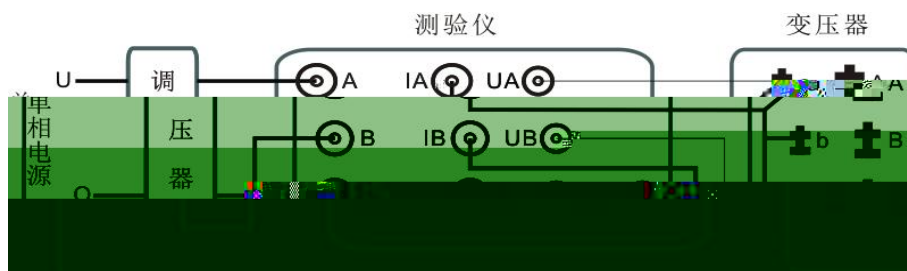


graph 84

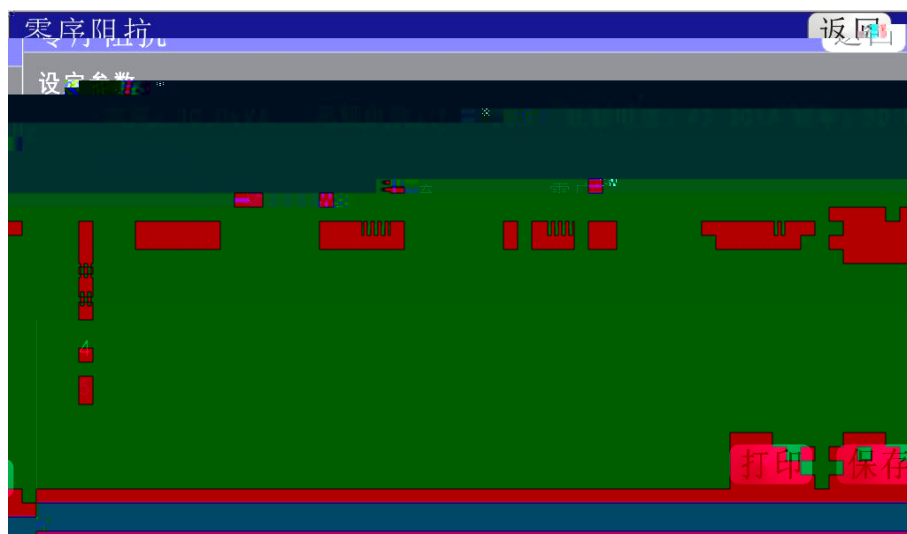


X, the





graph 88



容量判定-无源负载损耗→无源空载损耗

返回

设定参数:

容量: 30.0kVA 锁定电流: 1.732A 频率: 50.0Hz 空损系数: 1.172

测试参数:

	电 压	电 流	频 率	有功功率
U ₁	0.00V	0.000A	0.000Hz	0.000W
U ₂	0.00V	0.000A	0.000Hz	0.000W
U ₃	0.00V	0.000A	0.000Hz	0.000W

负载损耗: 0.000W 0.000W

保存

容量判定-无源负载损耗→无源空载损耗

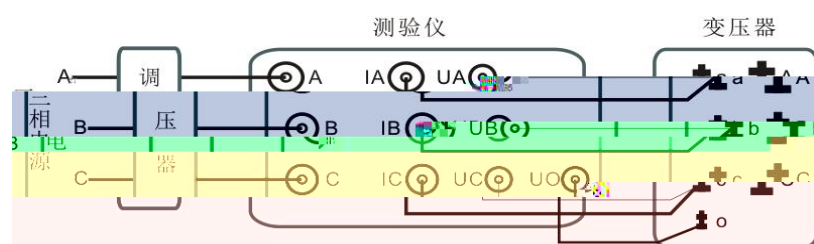
返回

设定参数:

容量: 30.0kVA 锁定电压: 0.400kV 频率: 50.0Hz 空损指数: 2.000

测试参数:

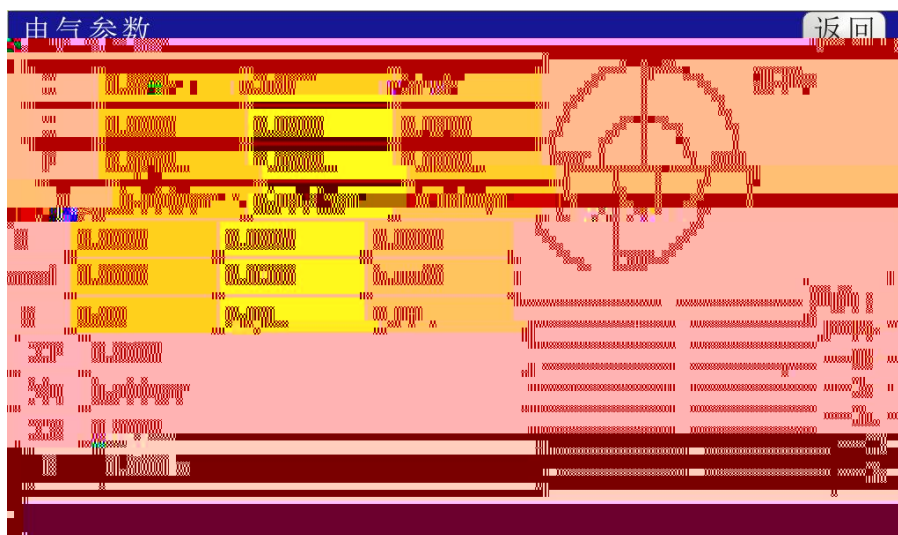
	电压平均值	方均根值	差 值	电 流	频 率	有功功率
U ₁	0.00V	0.00V	0.00V	0.000A	0.000Hz	0.000W
U ₂	0.00V	0.000V	0.00V	0.000A	0.000Hz	0.000W
U ₃	0.00V	0.000V	0.00V	0.000A	0.000Hz	0.000W
U ₄	0.00V	0.000V	0.00V	0.000A	0.000Hz	0.000W





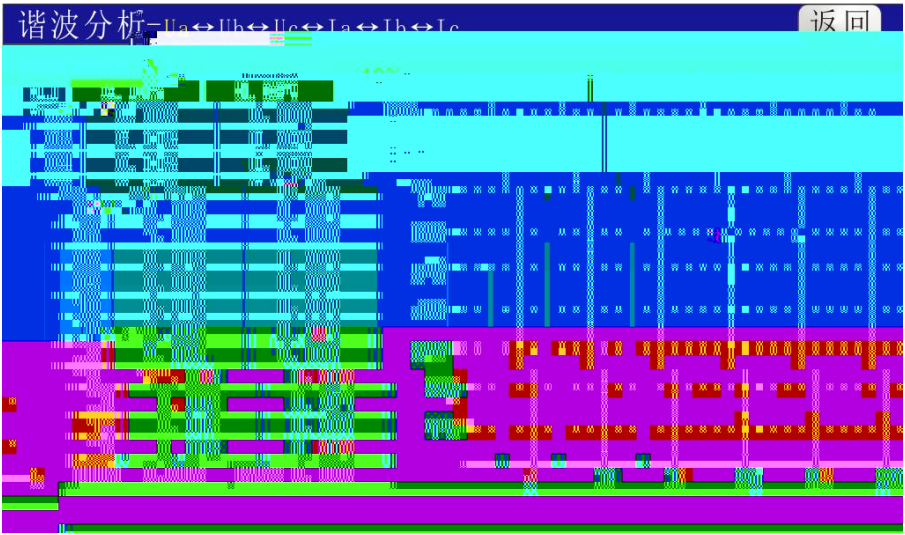
Xii. Measurement of electrical parameters

Measure the electrical parameters of the three-phase or single-phase transformer, and the electrical parameter measurement interface is shown in Figure 99.



Open or close the corresponding waveform curve: it can be realized by touching the LCD screen or " ", " ", "confirm" key to select each phase voltage and current channel.

Thirteen, harmonic analysis



Y

H1 M

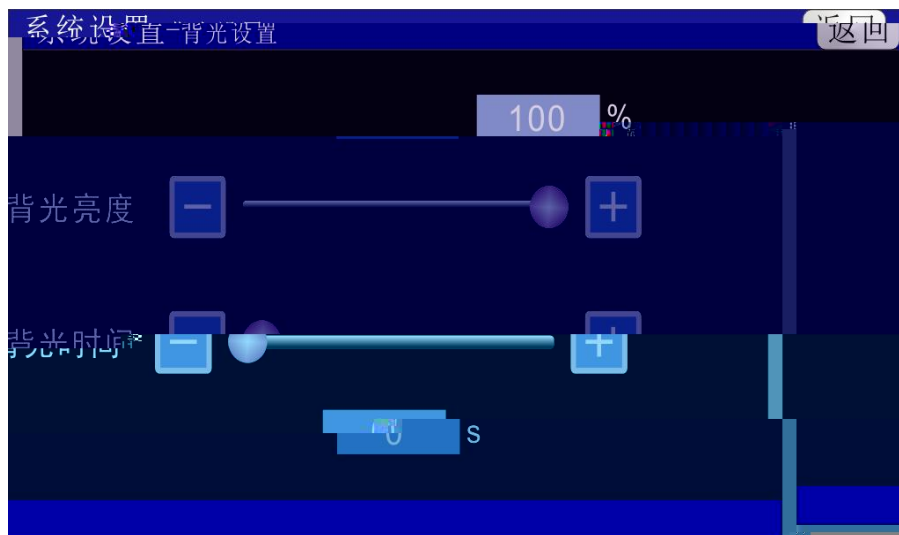
U L J K W

XV. System setting

The system setting includes four parts: parameter correction, backlight setting, time setting, and software version.

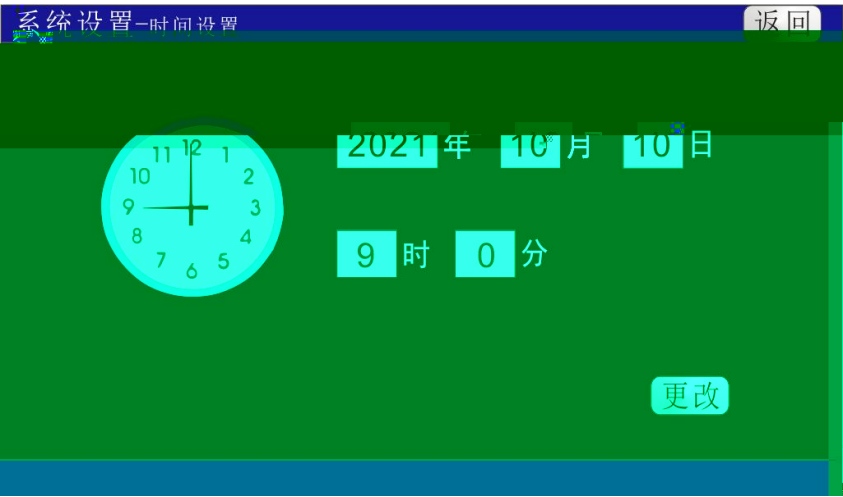
Parameter correction: set at the factory, the user does not need to operate, if the change will affect the measurement of each parameter.

Backlighting setting: As shown in FIG. 102, the user may set the backlight brightness and the backlight time as required. If the backlight brightness is set to 30% and the backlight time is set to 30S, the LCD screen will be reduced from 100% to 30% brightness after 30S without any operation of the instrument, and the touch LCD screen will be restored to 100% brightness.



graph 102

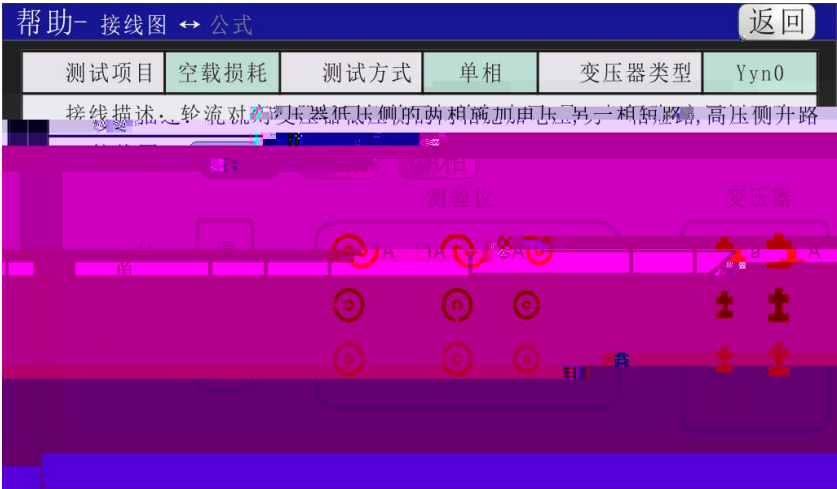
Time setting: As shown in Figure 103, after setting the time, press the change key to display



graph 103

Softwa

graph 105



graph 106

winding temperature rise.

7. When measuring load loss, the short route of the low voltage side should be thick enough to withstand the rated current of the low voltage

Appendix 1 Common failures and analysis of the instrument

Appendix II Determination of test power supply capacity during no-load loss test

In order to select the suitable test power supply, the capacity must be determined before the test. According to the nameplate capacity of the tested transformer and the percentage of no-load current contained in the nameplate (if there is no nameplate or the nameplate, the rated data of the same type transformer can be checked). When the test is conducted at the rated voltage, the following calculation:

$$S = S_N \cdot 10\% \cdot K / 1.0$$

The three-phase power supply capacity required by the S --test;

S_N -Rated capacity of the transformer;

10% --% of empty-load current.

K -coefficient power supply is the regulator K=2.5 power supply is the generator

K=5;

Empically, the formula is also practical

$$S = S_N \cdot K$$

The three-phase power supply capacity required by the formula S --test;

S_N -rated capacity of the transformer

Empirical coefficient can be selected between 0.05 and 0.10

If a single-phase power supply is used the power supply capacity = three-phase power supply capacity / 1.5

Appendix 3 Load loss, short circuit impedance, capacity analysis, and determination of test power supply capacity during test

The required three-phase power supply capacity S can be calculated in the following equation:

$$S = S_N \cdot (U_k\%/100)U \cdot (I_k/I_N)^2$$

The required test three-phase voltage

$$U = U_N \cdot \frac{I_k}{I_N}$$

diagonal line applies to the $Y_{\text{yn}} 0$ coupling group.

short-circuit
impedance%

Note: For transformers with rated capacity of 500 kVA and below, the load loss value above the diagonal in the table applies to the Dyn 11 coupling group, and the load loss value below the diagonal applies to the Yyn 0 coupling group.

ИМДАГ

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Design

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