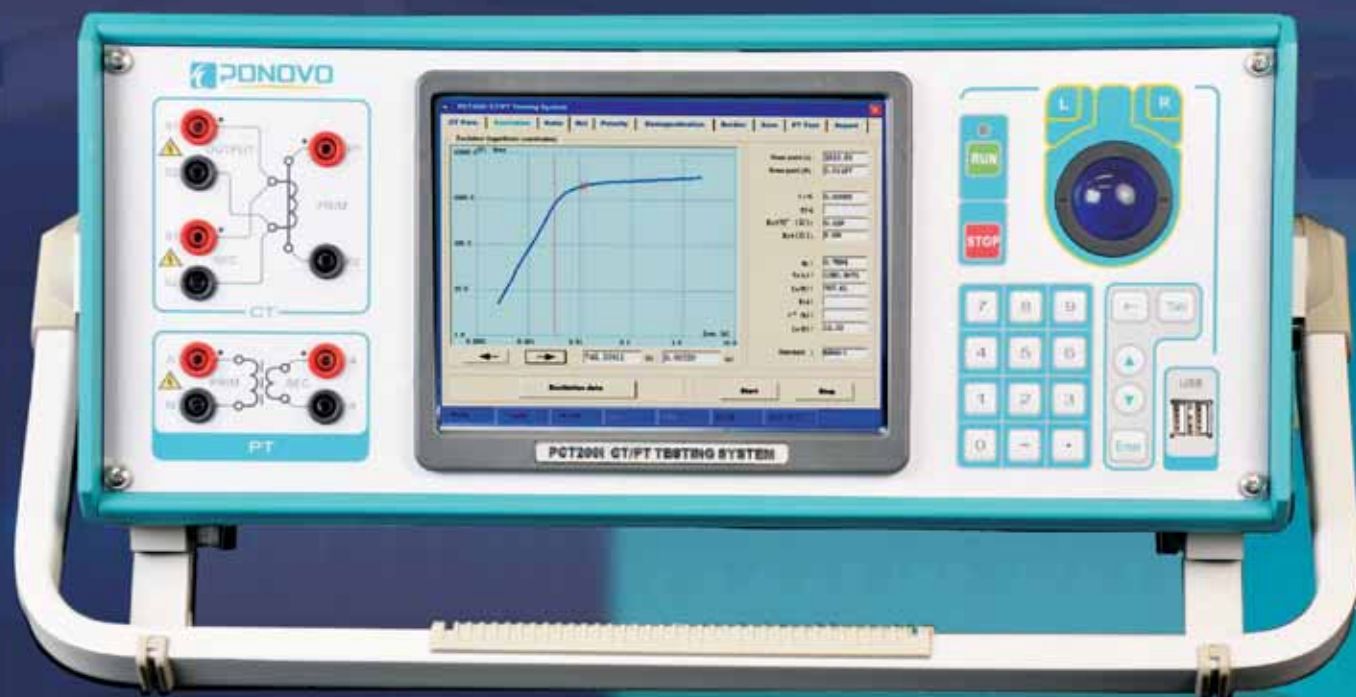




# Principle

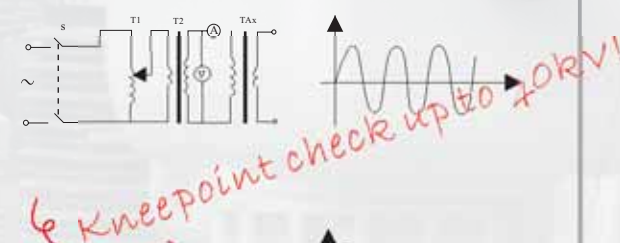
## Features:

1. Test CT according to IEC60044-1/6 and ANSI/IEEE C57.13
2. Can test all types of CT
3. One test can get all CT parameters
4. Fast test for excitation check
  - 10kV knee point check time: 50s
  - 1kV knee point check time: 15s

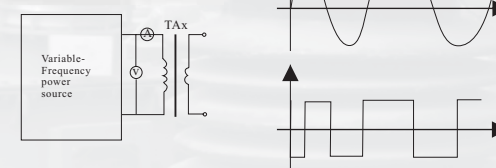


### Excitation characteristics test based on DC method

<Conventional method>



<New method>

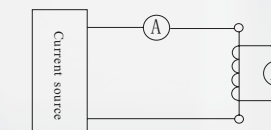


● Features of new method:

- Can check CT with high knee point value
- High efficiency, high accuracy, more safe

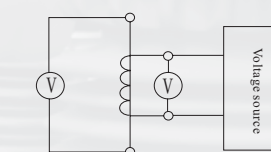
### Ratio test based on voltage method

<Conventional method>



Current source is at primary side and current measurement is at the secondary side  
*Ratio check up to 30000:1*

<New method>

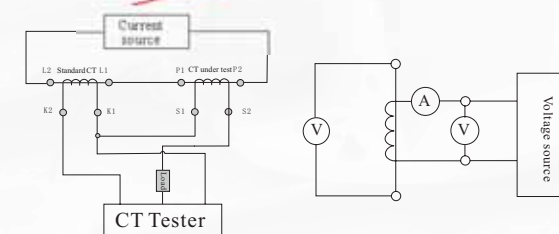
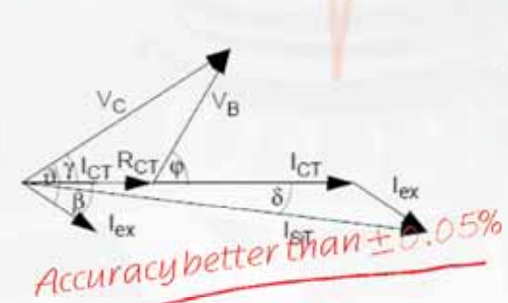


Voltage source is at secondary side and Voltage measurement is at primary side

● Features of new method:

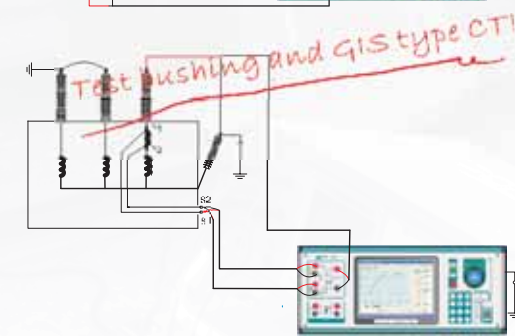
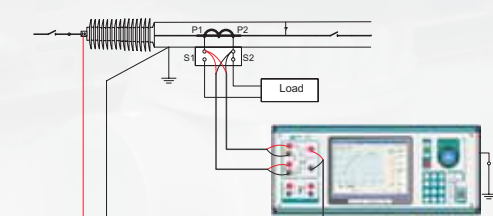
- Ratio check up to 30000:1
- Can check bushing CT
- Can check GIS CT

### Error check with extrapolation method for M type CT



- Get the ratio error and angle error based on extrapolation method, no need to use extra standard CT nor standard load.

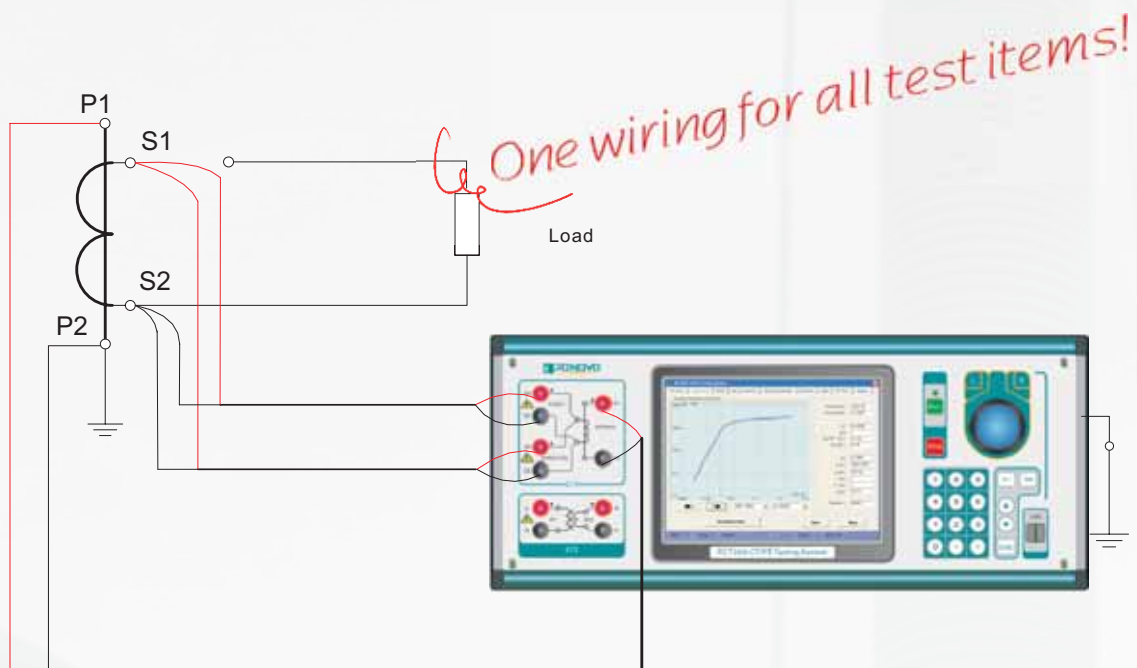
### Test special CT



- Bushing type CT requires large power output capacity which conventional CT tester can not give. New test method can solve this problem
- The primary side length is long for GIS type CT and this requires large power output capacity which conventional CT test can not supply. New test method can solve this problem

# Test at field

## Simple wiring



## Software Interface

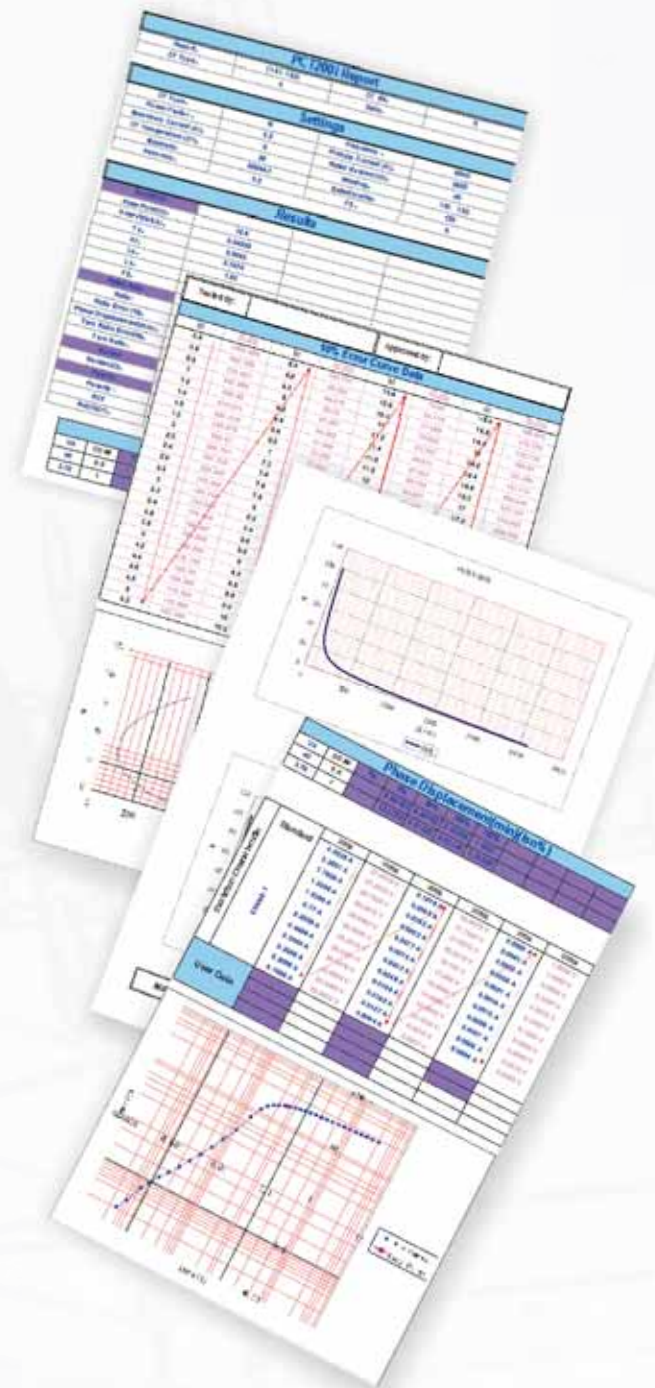
PCT200i operation

Easy to operate!

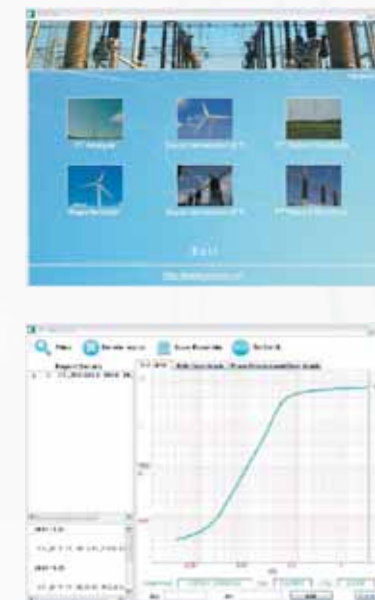


## Test Report

PCT200i Report



PCT series report analyze software



## Standard Accessories

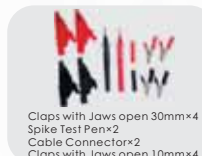
Soft bag



Test leads



Transportation Case  
(Anti Water & vibration)



- Excel format test report
- A4 size
- Test result can be exported to key drive through USB port.
- Can save 10.000 results in non-volatile memory

# Comparison with traditional method

## Shan Xi CT/PT Research Institute

Comparison with traditional test method



Test data Report

Nominal Range	Accuracy 0.2S					Secondary Load		
	Ratio Current Percentage	1%	5%	20%	100%	120%	V <sub>L</sub>	COS φ
1000/5 Ratio Difference	PCT200 Calibration Data	-0.24827	-0.13719	-0.10061	-0.07292	-0.06814	10	0.8
	Traditional Method Calibration Data	-0.228	-0.135	-0.095	-0.067	-0.064		
	Ratio Current Percentage	-0.02027	-0.00219	-0.00561	-0.00592	-0.00414		
1000/5 Phase Difference	PCT200 Calibration Data	12.79652	6.62382	4.24716	2.59789	2.54188	10	0.8
	Traditional Method Calibration Data	10.5	5.7	3.6	2.3	2.2		
	Result Comparison	2.29652	0.92282	0.64716	0.29789	0.34188		
Nominal Range	Accuracy 0.2S					Secondary Load		
	Ratio Current Percentage	1%	5%	20%	100%	120%	V <sub>L</sub>	COS φ
600/5 Ratio Difference	PCT200 Calibration Data	-0.719	-0.37956	-0.21901	-0.12466	-0.12006	10	0.8
	Traditional Method Calibration Data	-0.751	-0.382	-0.222	-0.113	-0.103		
	Result Comparison	0.032	0.00244	0.00299	-0.01166	-0.01706		
600/5 Phase Difference	PCT200 Calibration Data	30.25675	16.08826	11.22173	5.90002	5.89824	10	0.8
	Traditional Method Calibration Data	28.2	14.8	9.7	5.5	5.1		
	Result Comparison	2.05675	1.28826	1.52173	0.40002	-0.00176		

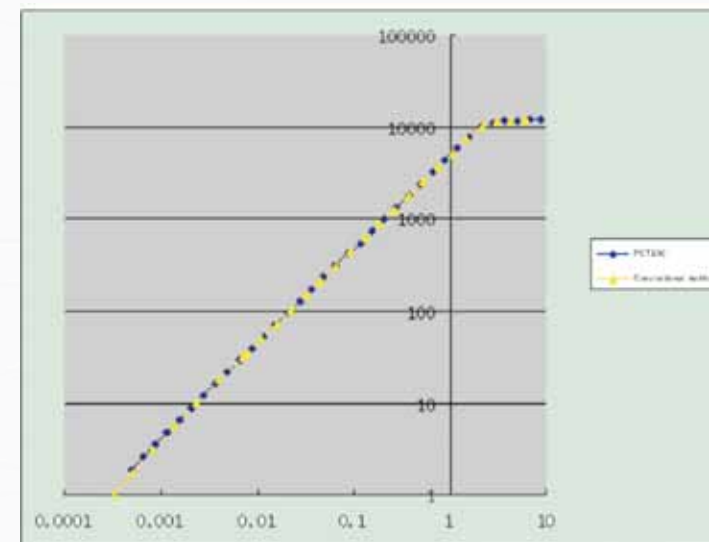
Comparison test with traditional CT test method was made in Shan Xi CT & PT Research Institute. 0.2 class reference CT was used in the test. The results show the maximum Ratio test difference is 0.08414% and the maximum Phase deviation test difference is 0.34188'.

# Field Test Examples

## Customer: Beijing High Transmission Company

Comparison of excitation tests between conventional test method and PCT200i

500kV TPY(transient) type CT



TPY type CT test	
V <sub>90%</sub> (V)	5079.69
I <sub>90%</sub> (A)	2.25468
Polarity	decreasing
W <sub>90%</sub> (VA)	1.031
WCT (%)	5.8812
I <sub>a</sub>	5.209
L <sub>a</sub>	22.46
R <sub>a</sub>	24.276
σ"	7.205
I <sub>a</sub>	0.71
R <sub>a</sub>	0.8713
Under rated load	
Ratio	7500:1.0000
Ratio error (%)	0.07
Angle error (min)	16.76
Turn ratio (%)	1.209

Test results

## Chongqing Power Plant

Generator Output CT



Generator output 6000:1 Test Result

Excitation Data	
Knee Point Voltage (V)	1012.3 V
Knee Point Current (A)	0.0175 A
Secondary Time Constant (Ts)	14.7147 S
Remanence Coefficient (Kr)	0.738
Unsaturated Inductance (L <sub>u</sub> )	346.28 H
Saturated Inductance (L <sub>s</sub> )	2.921 H
ALF coefficient	>50.309
Composite Error	0.0199 %
Ratio Ratio Data	
Ratio	6000:1.0003
Ratio Difference	0.033
Phase Difference (min)	1.667



### Tianjing Huapanshan Power Plant

500kV Tranformer Bushing CT



500kV Transformer Casing CT TYPY Class 1250:1 test Datasheet

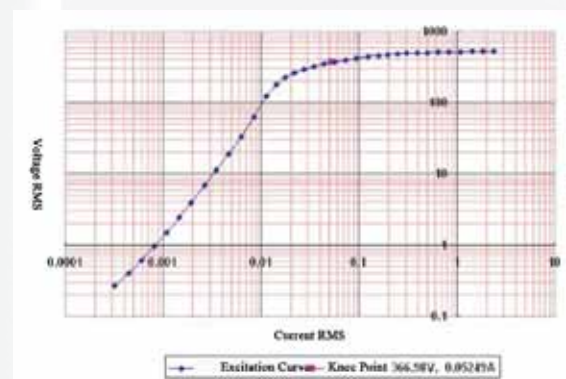
Rate Current Percentage	
Knee Point Voltage (V):	<b>13056.52 V</b>
Knee Point Current (A):	<b>2.33426 A</b>
Secondary Time Constant (Ts):	<b>1.3271 S</b>
Remanence Coefficient (Kr):	<b>0.0424</b>
Remanence Coefficient:	<b>27.49 H</b>
Unsaturated Inductance (Ls):	<b>0.206 H</b>
Transient Area Coefficient (Ktd):	<b>8.806</b>
Instantaneous Peak Error (Ls):	<b>2.112 %</b>
Equivalent Secondary Limited EMF:	<b>4176.73 V</b>
Multiple of Symmetrical SCC:	<b>&gt;55.649</b>
Rate Ratio Data	
Ratio:	<b>1250:0.9894</b>
Ratio Difference:	<b>-1.065</b>
Phase Difference (minute)	<b>8.343</b>

### Shan Xi 500kV Substation

220kV Transmission Line CT



220kV Transmission line GIS CT P Class 1250:1 excitation characteristic curve



### Szechwan Substation (500kV)



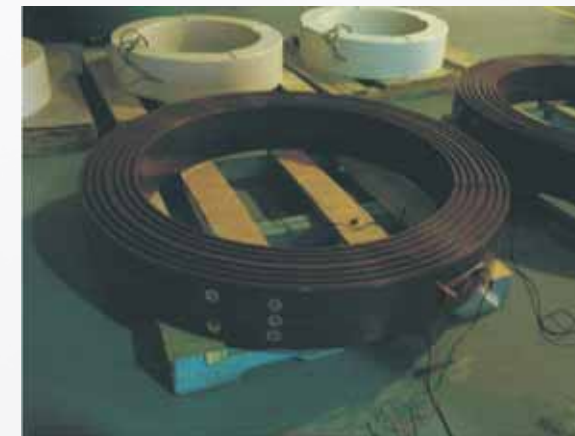
500kV Class CT TYPY 4000:1 Test result

Excitation Data	
Knee Point Voltage (V)	<b>7312.42 V</b>
Knee Point Current (A)	<b>1.83965 A</b>
Secondary Time Constant (Ts)	<b>1.194 S</b>
Remanence Coefficient (Kr)	<b>0.0213</b>
Unsaturated Inductance (Ls)	<b>19.37 H</b>
Saturated Inductance (Ls)	<b>0.168 H</b>
Transient Area Coefficient (Ktd)	<b>8.79</b>
Instantaneous Peak Error (Ls)	<b>2.343 %</b>
Equivalent Secondary Limited EMF	<b>480.47 V</b>
Multiple of Symmetrical SCC	<b>60.205</b>
Rate Ratio Data	
Ratio	<b>4000:0.9950</b>
Ratio Difference	<b>-0.496</b>
Phase Difference (minute)	<b>9.775</b>

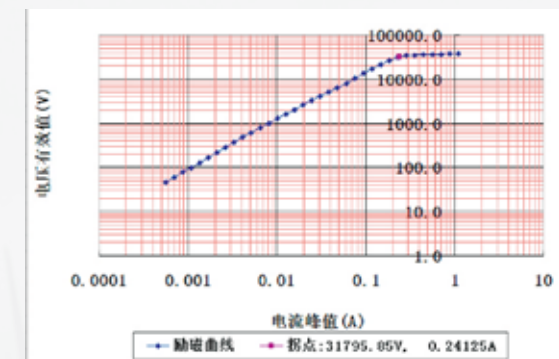
200 kV transmission line GIS CT Class P 1500:1 Test result

Excitation Data	
Knee Point Voltage (V)	<b>1726.02 V</b>
Knee Point Current (A)	<b>0.02783 A</b>
Secondary Time Constant (Ts)	<b>7.1649 S</b>
Remanence Coefficient (Kr)	<b>0.7865</b>
Unsaturated Inductance (Ls)	<b>291.39 H</b>
Saturated Inductance (Ls)	<b>5.443 H</b>
ALF	<b>53.301</b>
Composite Error	<b>0.1017 %</b>

### Shen yang CT/PT factory



Shen yang CT/PT factory



Generator Output TYPY CT

Excitation Data	
Knee Point Voltage (V)	<b>31795.85 V</b>
Knee Point Current (A)	<b>0.24125 A</b>
Secondary Time Constant (Ts)	<b>3.657</b>
Remanence Coefficient (Kr)	<b>0.0091</b>
Unsaturated Inductance (Ls)	<b>634.58</b>
Saturated Inductance (Ls)	<b>6.88</b>
Transient Area Coefficient (Ktd)	<b>12.809</b>
Multiple of Symmetrical SCC	<b>7.729</b>
Instantaneous Peak Error (Ls)	<b>1.115</b>
Equivalent Secondary Limited EMF	<b>12224.75</b>
Rate Ratio Data	
Ratio	<b>35000:1.0001</b>
Ratio Difference	<b>0.013</b>
Phase Difference (minute)	<b>2.217</b>

# PCT200 Series CT/PT Test System

## Specifications



**PCT200i**

**PCT200Ai**

Application	PCT200i	PCT200Ai	
	Test M/P/TP type CT and PT	Test M/P/TP type CT and PT	
Specifications			
Output voltage range	0~120V	0~120V	
Output current range	0~5Arms(15A peak)	0~5Arms(15A peak)	
Output power	0.0001~500VArms(1500VA peak)	0.0001~500VArms(1500VA peak)	
CT	Ratio test range	35000:1~45000:5	35000:1~45000:5
	Ratio test accuracy	±0.1%	±0.05%
	Max. knee point voltage	45000V	45000V
	Burden test range	0.05~200Ω	0.05~200Ω
	Burden test accuracy	±0.05%±1mΩ Typ. ±0.1%±1mΩ Gur.	±0.05%±1mΩ Typ. ±0.1%±1mΩ Gur.
	Winding resistance test rang	0.05~200Ω	0.05~200Ω
	Winding resistance test accuracy	±0.05%±1mΩ Typ. ±0.1%±1mΩ Gur.	±0.05%±1mΩ Typ. ±0.1%±1mΩ Gur.
	Accuracy limiting factor (ALF)	Yes	Yes
	Instrument security factor (FS)	Yes	Yes
	Remanence flux (Kr)	Yes	Yes
	Secondary time constant (Ts)	Yes	Yes
	Unsaturated inductance (Lu)	Yes	Yes
	Saturated inductance (Ls)	Yes	Yes
	Excitation characteristic curve	Yes	Yes
	10%(5%)error curve	Yes	Yes
	Rated symmetrical short circuit current factor (Kssc)	Yes	Yes
	Accuracy limiting voltage (Eal)	Yes	Yes
	Transient dimensioning factor (Ktd)	Yes	Yes
	Peak instantaneous error (ε')	Yes	Yes
	Composite error (ε <sub>c</sub> )	Yes	Yes
Ratio error	±0.05%Typ. ±0.1%Gur.	±0.02% Typ. ±0.05% Gur.	
Phase displacement	1min Typ. 3min Gur. 0.1min	1min Typ. 2min Gur. 0.01min	
Others	Main supply	110-240Vac/50-60Hz (nominal) 90-260Vac/45-65Hz (permissible)	110-240Vac/50-60Hz (nominal) 90-260Vac/45-65Hz (permissible)
	Operation temperature	-10°C~50°C	-10°C~50°C
	Relative humidity	≤90%,non-condensing	≤90%,non-condensing
	Dimensions	470 x200 x 245mm (W×H×L)	470 x200 x 245mm (W×H×L)
	Weight	11Kg	11Kg
	LCT display	8.4 inch, color display windows	8.4 inch, color display windows

