

- 漆包线检测仪器
Enamelled Wire Testing Machine
- 阻燃性能试验机
Flame Resistant Testing
- 新能源汽车电机测试系统
New Energy Vehicle Motor Testing System



SOLUTION FOR NEW-ENERGY VEHICLE MOTOR TESTING

新能源汽车电机测试系统 集成服务商

企业简介 INTRODUCTION

上海迪安电工器材有限公司是“迪安电工集团”下属的高新技术企业。公司主要从事新能源汽车电机检测仪器的研发和制造。“迪安电工”拥有的电机生产和质量控制的核心专利技术，使迪安电工仪器能满足汽车电机行业的全覆盖检测要求。

从原材料实验室控制到所有电气参数的在线质量检测直至最终电动汽车电机的质量评估，“迪安电工”为新能源汽车电机生产提供全过程的质量控制。公司强大的国际技术团队为客户从产品研发到全套解决方案提供强有力的技术保证。

作为国际电工委员会（IEC）电气绝缘材料专家成员，“迪安电工”积极参与全球电动汽车电机各种技术标准的制定，从而保证迪安电工仪器始终处于世界前沿水平。欢迎新能源汽车电机行业同仁来迪安电工交流合作！

Shanghai Dean Electrical Co., Ltd. is a high-technology enterprise which belongs to DEAN GROUP. It specializes in research, development and production of electrical test equipment for EV motor manufactures worldwide. It's extensive process know how of electrical motor production and quality level, allows Dean to align the features of their testing equipment with the outmost market requirement.

From income raw material control in laboratory, to inline quality control of all electrical parameters up to finished EV drive evaluation, Dean offers a wide range of systems and devices to measure the production quality. The strong technical team supports the international customers from R&D up to finished turn-key solutions. An additional powerful international network of specialists and institutes allows Dean to go beyond boundaries.

As expert in the International Electrical Committee (IEC) to set up international standards for electrical insulation material, all the required testing for the EV drives will be at the highest possible level.

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仪器说明

满足国际大厂标准测试项目的需求
 程式控制与分析，减少人为疏失与误判
 简易编辑环境，易学习
 可同时测试多组待测物(依产品绕线圈数而定)
 多颗待测物进行测试时，可单独判别不良组别
 层间短路波形比对，为非破坏性分析
 极性测试
 储存档案最多可至100组
 提供密码功能
 测试速度快，节省时间，提高效率
 中英文页面可任意切换

DESCRIPTION

To meet the standard test projects requirement of the international companies
 To control and analysis the programs will reduce the human careless and misjudgment
 Easy to edit environment and easy to learn
 It can test multiple sets of DUTs simultaneously
 When there are several DUTs are tested, it could identify the undesirable sets individually
 The Impulse/Surge with waveform comparison is a non-destructive analysis
 Polarity test
 Maximum saved files will be up to 100 sets
 It provides the password function
 Speeding test could save time and improve efficiency
 Chinese and English pages can be arbitrarily switched



仪器参数

直流电阻 DCR

测量范围 Range		
稳定精度 Accuracy	低阻Low Resistance	0.1mΩ ~ 1Ω ±(0.2% ± 1mΩ)
	高阻High Resistance	1Ω ~ 100kΩ ±0.1%

直流电阻 DCR

测量范围 Range	0.1mΩ ~ 150Ω	
稳定精度 Accuracy	0.1mΩ ~ 200mΩ: ±(0.1% ± 0.5mΩ)	
	200mΩ ~ 1Ω: ±(0.1% ± 2mΩ)	
	1Ω ~ 150Ω: ±0.5%	

耐压 HIPOT

测量电压 Voltage	AC 0.1kV ~ 5kV DC 0.1kV ~ 6kV
漏电流 Leakage Current	AC 0 ~ 10mA DC 0 ~ 5mA
电弧侦测 Arcing	0 ~ 9
测试时间 Test Speed	0.1 ~ 99.9s
稳定精度 Accuracy	3%

绝缘电阻 IR

测量电压 Voltage	100V ~ 1000V ± 5%
测量范围 Test Speed	1MΩ ~ 9.9GΩ
测试时间 Range	0.1 ~ 99.9s
稳定精度 Accuracy	3%

匝间短路 Shor Circuit

测量电压 Voltage	0.2kV ~ 5kV ± 2%
测量项目 Function	波形总面积、波形面积差、波形颤动数、波形比对、电晕数 Total Area、Area size comparison、Flutter、Waveform comparison、Corona
稳定精度 Accuracy	2%

电感 LCR Meter

测量频率 Frequency	20Hz ~ 1MHz
AC测试信号 AC test signal level	10mV ~ 2Vrms (1m Vrms 解析度)
测量范围 Range	0.01mH ~ 100kH





仪器参数

供电：单相 220 V 50HZ
功率：5 kw
测试环境箱：室温至300℃
额定电压：5kV、10kV
额定电容量：1000pF、2000pF
外型：800x900x1500mm

PARAMETER OF TESTER

Power supply: 1 phase 220 V 50HZ
Power: 5KW
Test temperature: 300 °C
Rated voltage: 5KV, 10KV
Rated capacitance: 1000pF, 2000pF
Dimensional : 800x900x1500mm

仪器描述

原理

与高频脉冲局部放电会产生声光电现象不同，工频交流电压达到一定阈值时，会在样品周围产生瞬间泄漏电流并产生放电电荷，这种放电并没有光电现象，但可以通过对放电量（单位：库伦/PC）的连续检测进行局部放电现象的分析评估。

本仪器PDIV 500-T试图通过对绝缘介质，如漆包线，绝缘纸/膜，电机定子规定的温度及湿度环境中，在绝对屏蔽箱体施加按一定升压速度升压的工频电压，通过耦合电容，对样品周围的放电量进行连续检测，形成电压与放电量的对应关系曲线，通过软件找到放电量突变点的电压阈值即所谓的绝缘介质的起晕电压。

PRINCIPLE

Differing from partial discharge with high frequency pulse which produce sound and light phenomenon, the power frequency AC voltage reaches a certain threshold, can only produce instantaneous current leakage around the tested sample, it can be detected through discharge capacity (unit: PC) to evaluate partial discharge phenomena.

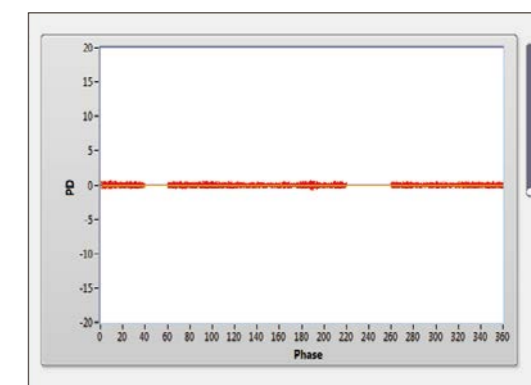
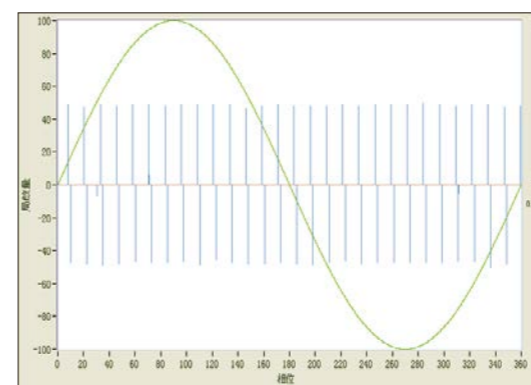
The instrument PDIV 500-T is designed to put samples such as enameled wire, insulation paper/film, and electric motor stator in the High temperature / humidity environment chamber, applying a power frequency voltage with a programed rising speed, and perfect ground connection must be guaranteed, through the coupling capacitor as the medium, the continuous detection of discharge capacity against the voltages will create formulation between the Voltages and discharge capacities (pc), the software will find the discharge voltage threshold called PDIV.

结构

无局放工频电压升压系统 0-1000V
放电采集耦合电容
局部放电测试仪
工控电脑系统及分析软件
带空间屏蔽的高温箱（湿度可选）300 C
适合不同介质的试样测试架

STRUCTURE

Zero discharge leakage power supply system.
Discharge collection coupling capacitance.
Partial discharge tester.
Industrial control computer system and analysis software.
High temperature (humidity) cabinet with perfect ground connection.
Test stands suitable for different samples.



EVTP-30
ATF油冷电机高低温交变冲击试验系统
High & Low Temperature Impact System For Atf Cooling Motor



仪器参数

Tmin = -20° C
Tmax= 150° C
周期时间: 60-80分钟
循环周期: 1100次
逆变电压: 500V 直流
频率: 9KHZ
系统功率: 15 KW
电源: 三相 380V 50HZ 15A
外型尺寸: 500x600x1500mm

PARAMETER OF TESTER

Tmin = - 20 ° C
Tmax = 150 ° C
Cycle time: 60-80 minutes
Number Of Cycle : 1100 times
Inverter voltage: 500V dc
Frequency: 9 KHZ
Power: 15KW
Power supply: 3 phases 50hz
Dimension: 500x600x1500mm

仪器描述

本测试系统通过模拟新能源汽车ATF油冷电机在运行过程中自身极限发热以及超冷运行多循环后的电机绝缘性能评估，为新能源汽车电机寿命提供最直接的依据。

This test system provides the most direct life evaluation of ATF cooling based EV motor by simulating the temperature impact from ultimate self- heating of the motor and severe cold condition from environment.

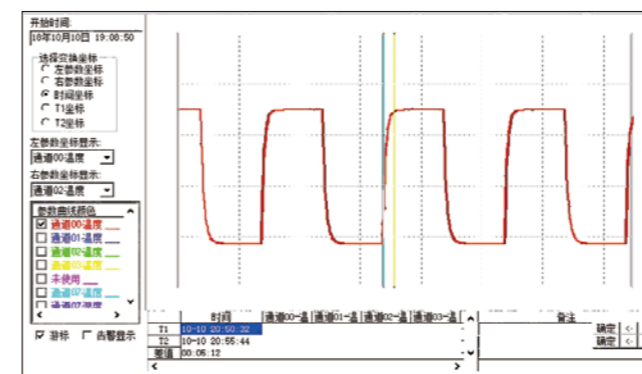
工作原理及操作步骤

通过自动吊装系统将三相电机定子置于高压密封罐中并固定
将定子三相接线端与高频电源相连接
在密封罐中注入ATF 油
设置试验要求的温度曲线
启动系统工作按钮，加热系统将按温度曲线要求将工件加热至设定的高温
当系统温度达到设定的高温时，加热系统关闭，系统切入冷却模式。
然后通过高效的制冷系统将工件按降至设定的低温
根据温度曲线要求系统反复自动循环高低温冲击测试
循环测试周期结束后对工件进行绝缘耐压和绝缘电阻测试评估

THE WORKING PRINCIPLE AND PROCESS

Put the three-phase stator into high pressure resistant tank and fix it well.
Electric connected the stator to the high frequency power supplier.
Fill in the ATF oil into the tank.
Set a specified temperature curve through the software.
The stator and ATF oil will be heated through the high frequency eddy current principle.
The heating system is automatically switch off and turn to cooling process.
The stator will be cooled down to the low temperature through the High efficient refrigeration system.
Repeat automatically the cycled impact test according to the programme.
Conduct the high voltage and electric resistance test on the stator to evaluate on the performance of the stator.

系统基本结构	BASIC STRUCTURE OF THE SYSTEM
耐高压密封油罐	High pressure resistant sealed tank
高频涡流加热系统	High frequency eddy current heating system
油泵循环单元	Oil pump circulation unit
制冷系统	Refrigeration system
智能自动化控制系统	Intelligent automatic control system
自动吊装系统	Automatic lifting system
系统集成保护箱体	System integrated protection cabinet
可选件: 电机定子电性能测试系统 EVT-531	Optional: Electrical performance test system for motor stator EVT531



DPT-1000S 漆包线耐电晕测试仪 Corona Resistant Tester of Enamelled Wire



仪器说明

DPT1000符合国标GB/T 21707-2008、GB/T 24122-2009、GB14711-2013的要求，满足JB/T 10930-2010；可同时测试多个漆包线试样；用于测试漆包线耐高频脉冲的特性（耐电晕性能）。

DESCRIPTION

The tester is comply with the requirements of standards GB/T 1707-2008, GB/T 24122-2009, GB14711-2013, meet the requirement of standard JB/T 10930-2010; Multiple samples can be tested at same time; Used for testing the feature of high frequency pulse resistance (performance of Corona-resistance).

仪器参数

脉冲波形：方波
脉冲极性：双极性
脉冲频率：2~20KHz（连续可调）
脉冲电压（Vp-p）：0.4~3KV（连续可调）
脉冲上升沿：50~400ns（连续可调）
脉冲占空比：≤50%（连续可调）
测试温度：室温~250℃
可测直径0.5~6.0mm的漆包圆线
可测最大边5.0×16.0mm的漆包扁线

电源及要求

输入电压220V
频率50/60Hz
功率2KW
电源接地

PARAMETER OF TESTER

Pulse wave: square
Pulse polarity: bidirectional
Pulse frequency: 2~20KHz
Pulse voltage (Vp-p): 0.4~3KV
Rising edge: 50~400ns
Duty cycle: ≤50%
Testing temperature: normal atmosphere temperature ~250℃
Test range of enamled round wire: φ0.5-6.0mm
Test range of enamelled flat wire: ≤5×16mm

POWER SUPPLY AND REQUIREMENTS

Input voltage: 220V
Frequency: 50/60Hz
Power: 2KW
Power grounding

仪器特点

可有效的测试漆包线的耐电晕性能；
由耐电晕测试仪、制样器（分圆扁线）和一台电脑组成；
测试端1~5个，客户可根据需要选择；
圆扁线通用插座。

FEATURE OF THE TESTER

Test the performance of Corona resistance of enamelled wire effectively.
Composed of Corona resistant tester, devices of sample making (includes round wire and flat wire) and 1 set computer.
Testing ports: 1~5, selectable.
Common socket for round and flat wire.

测试软件及脉冲方波



测试软件界面 Interface of testing software



脉冲方波 Pulsed Square wave

测试过程简介

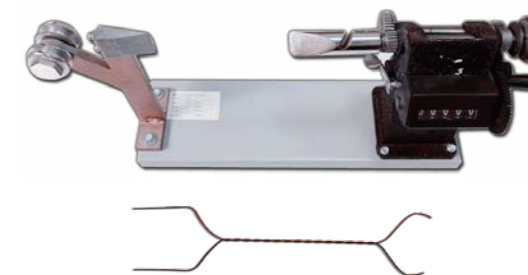
准备漆包线样品，每根漆包圆线样品自身扭绞，或用扁线制样器制成样品对，去除试样端脚漆膜，将试样插入测试烘箱内的夹具中。
测试开始后，烘箱自动升温至标准规定温度后，系统将自动向每个试样施加规定的脉冲电压，使试样产生电晕，直至样品被击穿。系统自动记录并保存样品耐电晕的时间以及其它测试参数，打印测试报告。
电脑软件具有示波器的显示功能。

INTRODUCTION OF TESTING PROCEDURE

Preparation of enamelled wire samples by twisted, or made by flat wire sample making device, remove insulation film of the ends, then fix samples in the clamping devices which inside the heating oven.
After beginning the test, the testing oven heats up automatically to standard temperature, the system will apply the set pulse voltage to each sample automatically, and make the samples produce corona until breakdown. The system will automatically record and save the samples corona resistance time as well as other testing parameters, and print the test report.
The software of computer has the display function of the oscilloscope.



扁线及扁线夹具 flat wire sample and making device



圆线及圆线绞线机 round wire and twisted device

TD-7S/8S
智能漆包线介质损耗测试仪
Intelligent Tangent Delta Tester of Enamelled Wire



仪器说明

用于漆包线固化程度的测试，通过tg δ 曲线变化直观的反应出漆包线的固化程度，并根据曲线的变化来调节炉温烘培时间，使漆包线的固化程度达到最佳状态，有效的控制漆包线的产品质量。快速检测漆包线的耐温等级，可以初步确定漆包线漆的品种。

DESCRIPTION

Tangent Delta Tester is used for testing the curing degree of enamelcover. The curve variation of tg δ shows the curing degree of enamelled wire directly, then adjust the heating temperature of enameling oven, to get a optimal curing degree of enamelled wire, control the wire quanlity effectively. The temperature class of enamelled wire can be tested rapidly; the enamel type of wire can be determined preliminarily.

仪器参数

工作温度：室温 ~ 350℃；具有快速冷却系统
 可测0.018 ~ 5.0mm 的漆包圆线
 可测最大边5 × 16mm的漆包扁线
 测试时间：约2 ~ 3分钟
 测试频率：1KHz
 两种D值测量上限：0 ~ 0.1、0 ~ 0.2
 测试精度：± 1℃
 介质损耗分辨率：0.0001或0.00001
 电源：AC220V ± 10%
 尺寸：480mm × 500mm × 320mm
 重量：35kg

PARAMETER OF TESTER

working temperatur: normal atmosphere temperature ~350℃, with rapid cooling system
 Test range of enamelled round wire: φ0.018-5.0mm
 Test range of enamelled flat wire: ≤5 × 16mm
 Testing time: about 2~3 minutes
 Testing frequency: 1KHz
 Two upper limits of D value measuremnt: 0~0.1、0~0.2
 Testing accuracy: ± 1℃
 Resolution: 0.0001 or 0.00001
 Power supply: AC220V ± 10%
 Dimension: 480mm × 500mm × 320mm
 Weight: 35kg

仪器特点

符合GB/T4074.5-2008、IEC60851-5.6;
 全新外形，轻巧美观，操作更方便;
 作为第三代智能介质损耗测试仪，夹具和加热系统有了彻底的升级;
 夹具的送进、就位和退出实现自动化，减小人为因素对测试的影响，确保每次样品均处于同一位置，更有效的提高了测试精度和一致性;
 5条tg δ 曲线的比较功能。

FEATURE OF INSTRUMENT

Comply with standard GB/T4074.5-2008, IEC60851-5.6.
 New appearance, light and beautiful, the operation is more convenient.
 As the third generation intelligent Tangent Delta Tester, there are complete update on clamping jaw and heating unit .
 The feeding, positioning and exit of the clamping jaw are operated automatically, reduce the influence of human factors act to the testing result, ensure samples are placed at the same position while testing, improve the accuracy and consistency of the tests more effectively.
 Comparison function of 5 tg δ -T curve

测试曲线

软件自动绘制介质损耗随温度变化的tg δ 曲线。tg δ 曲线形状大致由漆包线漆分子链中的偶极子情况决定，不过树脂结构中的一些未交联反应完全的极性基团：如羟基和异氰酸根等可导致tg δ 曲线变化，而催化剂和添加剂通常有其自身的偶极子，对曲线也有影响。有些助剂因为与漆基树脂反应，对曲线也有影响，并且溶剂中含有极性基团的甲酚、NMP等如果在漆膜中有残留，在tg δ 曲线上也会反映出来。

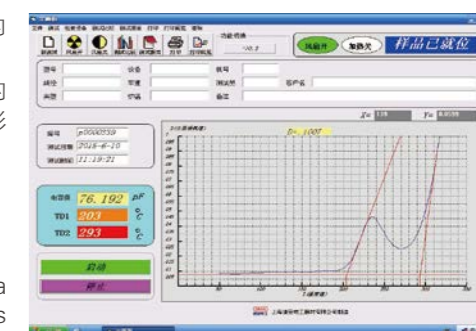


测试过程简介

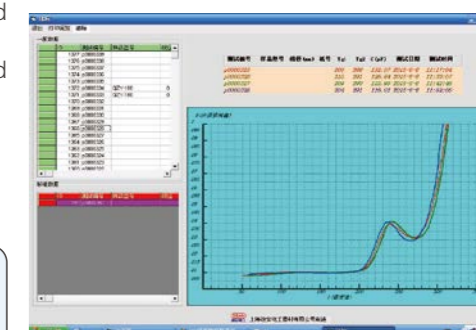
为了实施介质损耗的测试，须将漆包线处理成介质电容。由于涂覆在导体外部的漆膜是绝缘体，只要在漆膜的表面涂上一层石墨，石墨和导体间形成一个电容。取一根约12cm长的漆包线，将石墨涂覆在漆包线中间部位（涂覆长度约5cm），用电吹风吹干。石墨作为一个电极，漆包线里的导体为另一个电极，形成一个样品电容。夹具的送进和退出完全自动化操作，测试时漆包线固定在同一个位置。

INTRODUCTION OF TESTING PROCEDURE

In order to carry out the test of tg δ , enamelled wire must be treated as a dielectric capacitance. Because the enamel coated around the copper is insulator, a capacitor is formed between graphite and copper conductor provided that enamel coating is covered with a layer of graphite.
 Take a sample wire of 12mm length, coat graphite at the middle position (about 5cm length), then dry it. Thus Graphite is an electrode, copper inside enamelled wire is the other electrode, a sample capacitor is formed.
 The feeding and exit of the clamping jaw are operated automatically, enamelled wires are placed at the same position while testing.



tg δ 曲线
 tg δ -T curve



tg δ 曲线比较
 comparison of tg δ -T curve

可选:

TD-7S: 高分辨率、高精度。
 TD-8S: 测试频率1KHz、1MHz（可切换），可测1MHz下漆包线的介质损耗值、导体电阻、电容。

OPTION:

TD-7S: High Resolution and High Precision.
 TD-8S: testing frequency: 1KHz, 1MHz (switchable), tg δ of enamelled wire with 1MHz can be tested, as well as electric resistance and capacitor.



仪器描述

监控：可远程监控，开关针孔检测硬件控制器。
 实时监控：针孔数量，针孔位置（虚拟值，由轻微误差，如需精准要加装计米传感器）；
 数据存储：可外接扫码设备，可随时查询历史数据（查询方法：日期，轴号，条码等，或按客户要求）；
 数据采用图表或表格方式保存，不同线轴之间可生成图表对比图。
 开放通讯接口，客户可自行接入ERP系统或其它系统方便控制及数据查询。

PERFORMANCE CHARACTERISTICS OF PRODUCT

Monitoring: remote monitoring, switch pinhole detection hardware controller.
 Real-time monitoring: number of pinholes, pinhole position (virtual value, with slight error, meter sensor should be installed if accurate);
 Data storage: external scanning code equipment can be used to query historical data at any time (query method: date, axis number, bar code, etc., or according to customer requirements);
 Data shall be saved in charts or tables, and comparison charts can be generated between different spool.
 Open communication interface. Customers can access ERP system or other systems to facilitate control and data inquiry.

仪器参数

检测电压：0-3000v 无极可调
 阈值电流：8mA
 短路电流：< 30uA
 报警方式：声光报警
 控制：一体机触摸屏操控，SSID: USR-WIFI232
 模块控制：4路检测主机集成模块
 检测方式：采用毛刷检测或者导轮检测
 相对湿度：≤70%
 工作电压：AC 220V ± 10%
 消耗功率：20W

PARAMETER OF TESTER

Test voltage: 0-3000v pole-less adjustable.
 Threshold current: 8mA.
 short circuit current: less than 30uA.
 Alarm mode: sound and light alarm.
 Control: all-in-one touch screen control, SSID: usr-wifi232
 Module control: 4-way main engine integration module (4 different test voltages shall be selected).
 Detection method: brush detection or guide wheel detection can be used to achieve full detection.
 Relative humidity: ≤70% or less
 Operating voltage: AC 220V ± 10%
 Power consumption: 20W

