MODEL   19055

Function

- HIPOT
  - AC 5kV/100mA
  - DC 6kV/20mA
- Insulation
  - 5kVmax
  - 1MΩ~50GΩ

Feature

- 500VA output rating
- Floating output meet EN50191
- Corona Discharge Detection (CDD, option)
- Flashover Detection
- Discharge Level Analysis (DLA)
- Open Short Check (OSC)
- High Frequency Contact Check (HFCC)
- Ground Fault Interrupt
- Standard RS232 interface
- Option GPIB&HANDLER interface
- Key lock function as Fail
- Programmable Voltage & limit
- CE Mark

HIPOT ANALYZER MODEL 19055

Electrical Safety & Quality Testing

Chroma 19055 Hi-pot Analyzer series is designed for Hi-Pot test and Analysis. The test of AC/DC/IR can be programmed in 5kV/100mA with 500VA output rating which meet EN50191 requirements. (For more detail information, please refer application note)

Model 19055-C not only have AC/DC/IR test, but New measurement technology - Corona Discharge Detection (CDD). The Discharge Level Analysis (DLA) provide a test mode for electrical quality which can be used to detect discharge in:

- Corona discharge Start Voltage (CSV)
- Flashover Start Voltage (FSV)
- BreakDown Voltage (BDV)

Regarding Contact check while Hi-Pot test, Chroma 19055 series have High Frequency Contact Check (HFCC) and Open Short Check (OSC). HFCC detect contact lose by high frequency and perform with Hi-Pot test, highly efficient test can be created.

For convenience operation, Chroma 19055 have large LCD display for operation and judgment. Floating output and GFI function protect operator from electrical hazard.

Applications

• Motor : Chroma 19055 series have 500VA output rating for high current Hi-Pot testing and analysis like motor components which have higher Parasitic Capacitor.

• Transformer : Corona discharge caused components broken even if transformer be used in rate voltage. Corona discharge detection (CDD) of 19055-C can find out corona discharge for electrical quality improving.

• Capacitor, Photocoupler, Insulation material : If there have gaps or voids in insulation material after molding, insulation level may lower than designed . Corona discharge detection (CDD) of 19055-C can find these defects which impacted insulation ability.

R&D engineer can perform insulation analysis and then improve insulation ability by these new measurement technologies.

Chroma

## Dielectric Withstand Test – Breakdown / Flashover / Corona Discharge Detection

What does dielectric wthstand fail mean? Most of regulations write : "During the test, no flashover or breakdown shall occur." However, insulation failureure and discharge have been more important in materials and components. Because there is high relation between discharge and insulation ability, discharge is not only saftey issue but also a key point of electrial quality. Discharge have three types by material characteric: Corona discharge, Glow discharge and Arc discharge.

Corona Discharge: A type of localized discharge resulting from transient gaseous ionization in an insulation system when the voltage stress exceeds a critical value. The ionization is usually localized over a portion of the distance between the electrodes of the system and with lighting and temp rising. A long term of corona discharge and temp rising may cause qualitative Change of material, insulation deterioration, and finally insulation failure (a real corona discharge as figure). Corona discharge is a high frequency phenomenon which be able to detect by high level electric meter.
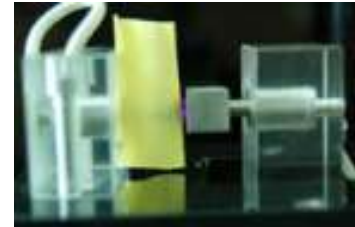
Glow Discharge and Arc Discharge: This is the electrical discharge generated by high electric field inside or on the surface of insulation material that makes the DUT lost its insulation and form a transient or discontinuous discharge. It causes the conductive path to be carbonated or the product to be damaged. Test for leakage current only is unable to screen out the defects. It is necessary to test the voltage or current for its change ration to screen out the defects. Thus Flashover detection is one of the most indispensable test items.
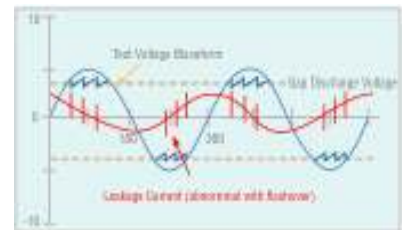

Flashover waveform

Chroma 19055 provide discharge level analysis including corona discharge detection (19055-C only), ARC/Flashover detection and breakdown detection for research and quality assurance.

Contact Check － High Frequency Contact Check (HFCC） & Open Short Check (OSC, patent:254135）

When open occurred during test procedure, FAIL product will be judged as GOOD product. When short occurred during test procedure, screening earlier to reduce the damage on equipment for saving test cost. Generally speaking, the DUT has capacitive load (Cx) from tens to thousands pF under normal status. To form a micro capacitance on open circuit interface once connection interrupted (as Cc). Generally speaking, the capacitance is lower than 10pF thus total capacitance is far lower than the status of normal product. The capacitance is far higher than normal status when DUT short or close to short. Therefore, users judge the short problem by using high/low limit value of capacitance change.

HFCC (High Frequency Contact Check) is a new measurement technology for contact check. HFCC is able to perform with Hi-Pot test by high frequency around 1MHz for higher efficiency on production line.
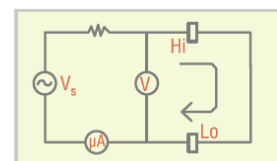
OSC (open / short check) is a mode for checking open & short on test circuit. OSC avoid equipment damage and test fail from circuit open and DUT short Before start the hipot test.
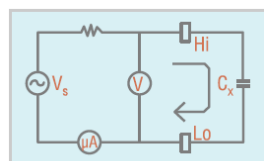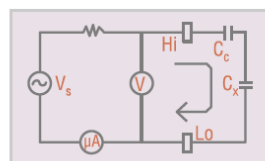
Normal Condition   If Circuit opened :   If circuit shorted : Cm >> Cx

DISCHARGE LEVEL ANALYSIS (DLA)

Dielectric withstanding voltage of component depends on material and Manufacturing Processes For improving insulation ability, discharge level should be defined including Corona discharge, Flashover and Breakdown. Chroma 19055 have Discharge Level Analysis mode (DLA) for definition by programming voltage, time, counts and limits.

Discharge Level Analysis (DLA) provide three level and programmable limit judgment of Corona limit, ARC limit for flashover, high limit for breakdown. DLA mode will show the withstanding voltage depend on the different level limit, that means corona discharge Start Voltage (CSV), Flashover Start Voltage (FSV), and Breakdown Voltage(BDV). R&D and QC dept. can improving insulation by discharge data collection and analysis.
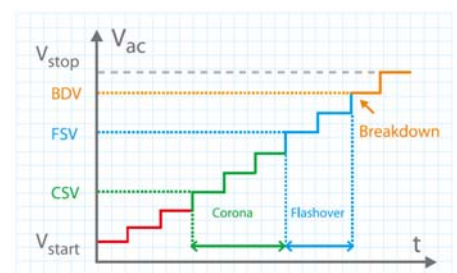
Operator Protection – Floating output／Ground Fault Interrupt (GFI)

Chroma develops Floating circuit by all new technology in order to let operator to use safety test equipment safely. Whatever the operator touches any Hipot test terminal under Floating status. The earth leakage current is lower than 3.5mA, the operator won't be hurt by electricity.

The requirement of test environment indicates that test equipment is equipped with auto interrupt device so that Chroma develops into Ground Fault Interrupt (GFI) function. When the current meter A1 and A2 detect the difference (i2-i1=iH) between the value i1 and actual i2 test current over high, this device can cut the power transiently for protecting human body safety. It is not only accordingly to the safety standard but also more safeguards for test personnel.
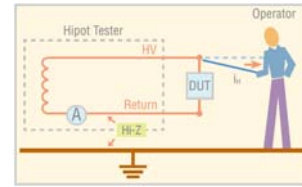

Floating output
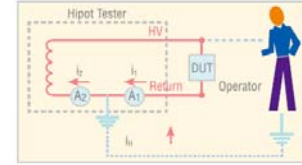
Ground Fault Interrupt

APPLICATION

Corona Discharge Detection (CDD) under rate voltage

Corona discharge caused components broken even if transformer be used in rate voltage. For example, most of power transformer have auxiliary winding in primary for other components used. As the figure, An input Vp=750V produce Corona discharge caused by manufacturing processes like insulation type fail or tubing fail. in After a Long time discharge inside lead to insulation qualitative change and failure.
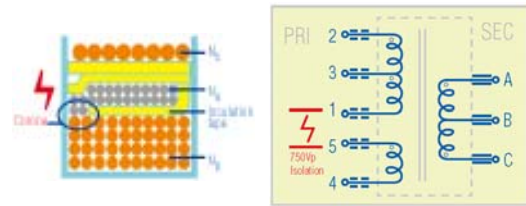

Primary winding fail cause insulation failure

### Discharge Level Analysis for Capacitor／Photocoupler／Insulation material

Generally, component research needs Discharge Level Analysis to verify insulation ability like high voltage capacitor, Photocoupler and Insulation material. If there are some gaps or voids inside insulation material, a electric field will change lead to corona discharge while a high voltage test performed.

Chroma 19055 Hipot Analyzer have Corona Discharge Detection (CDD) to find corona discharge out. Discharge Level Analysis can defined CSV, FSV, BDV and provide data for capacitor, photocoupler and other insulation materials analysis.
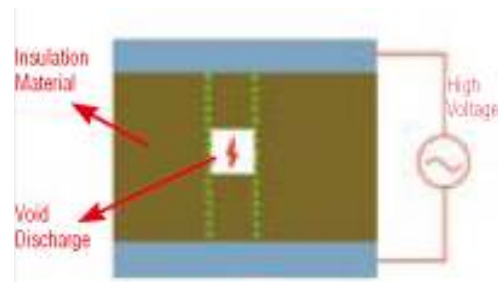
Void discharge

PANEL DESCRIPTION
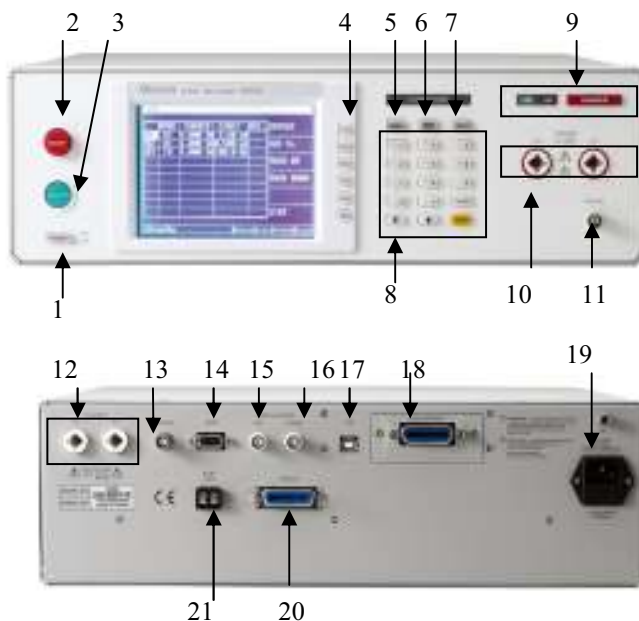
1. Power Switch
2. STOP Key
3. START Key
4. Function Keys
5. MENU Key
6. MAIN INDEX Key
7. LOCAL Key
8. Data Entry Keys/Program Keys
9. Indicator
10. HV1 / HV2
11. RTN/LOW
12. HV1 / HV2 (rear)
13. RTN/LOW (rear)
14. RS232 Interface
15. ARC Signal Monitor
16. Corona Signal Monitor
17. USB Interface
18. GPIB Interface (option)
19. Power Inlet
20. Handler Interface
21. Interlock

SPECIFICATIONS

Model	19055		
Mode	**ACV / DCV / IR**		
Withstanding Voltage Test			
Output Voltage	AC : 0.05 ~ 5KV, DC : 0.05 ~ 6KV		
Load Regulation	1% of setting + 0.5% full range		
Voltage Accuracy	1% of setting + 0.5% full range		
Voltage Resolution	2V		
Cutoff Current	AC:100mA;DC:20mA		
Current Accuracy	1% of setting + 0.5% full range		
Current Resolution	AC : 1 μ A, DC : 0.1 μ A		
Output Frequency	50Hz / 60Hz		
Test/Ramp/Fall/Dwell Time	0.3 ~ 999 sec., continue / 0.1 ~ 999 sec., off / 0.1 ~ 999 sec., off / 0.1 ~ 999 sec., off		
Waveform	Sine wave		
Insulation Resistance Test			
Output Voltage	DC : 0.05 ~ 5kV		
Voltage Resolution	2V		
Voltage Accuracy	1% of setting + 0.5% full range		
IR Range	1MΩ ~ 50GΩ		
Resistance Resolution	0.1MΩ		
Resistance Accuracy	>1kV	1MΩ ~ 1GΩ : $\pm$ 3% of reading + 0.1% of full range, 1GΩ ~ 10GΩ : $\pm$ 7% of reading + 2% of full range, 10GΩ ~ 50GΩ : $\pm$ 10% of reading + 1% of full range,		
	$\geqq$ 500V $\leqq$ 1kV	0.1MΩ ~ 1GΩ : $\pm$ 3% of reading + 0.1% of full range, 1GΩ ~ 10GΩ : $\pm$ 7% of reading + 2% of full range, 10GΩ ~ 50GΩ : $\pm$ 10% of reading + 1% of full range,		
	<500V	0.1MΩ ~ 1GΩ : $\pm$ 3% of reading + (0.2*500/Vs)% full range		
Scanner Unit	8 ports, $\pm$phase (4W DCR only 4 ports)		
Flashover Detection			
setting Mode	Programmable setting		
Detection Current	AC: 20mA;DC: 10mA		
Contact Check Function			
HFCC	High frequency contact check		
OSC (open/short check)	200Hz, 0.1s		
Electrical Hazard Protection Function			
Floating output design	Leakage current <3 mA		
Fast Output Cut-off	0.4ms after NG happen		
Ground Fault Interrupt	0.5mA $\pm$0.25mA AC, ON/OFF		
Panel Operation Lock	Present password		
Interlock	YES		
GO/NG Judgment Window			
Indication, Alarm	GO : Short sound, Green LED; NG : Long sound, Red LED		
Data Hold	Least tests data memories		
Memory Storage			
Interface			
RS232, Handler interface (Standard), GPIB interface (Optional).			
General			
Operation Environment	Temperature: 0℃ ~ 45℃, Humidity: 15% to 95% R.H@$\leqq$ 40℃		
Power Consumption	500VA		
Power Requirements	90~132Vac or 198~264Vac, 47~66Hz		
Weight			
Size			

ORDERING INFORMATION

19055   Hipot Analyzer AC/DC/IR

19055-C   Hipot Analyzer AC/DC/IR (with Corona discharge detection)

A190356   GPIB Interface

A190702   40kV HV Test Probe

A190708   ARC (Flashover) Verification Fixture

A190344   HV Gun (SP02)